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SUPPLEMENTS TO THE BULLETIN OF THE HISTORY OF MEDICINE

Editor: HENRY E. SIGERIST
Associate Editor: GENEVIEVE MILLER

No. 5

PUBLIC BATHS AND HEALTH IN ENGLAND, 16TH-18TH CENTURY

BY

CHARLES F. MULLETT

BALTIMORE
THE JOHNS HOPKINS PRESS
1946

Price: $1.50

For subscribers to the *Bulletin of the History of Medicine*: $1.25

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BY J. H. FURST COMPANY, BALTIMORE, MARYLAND

medical
Thayer
4-18-46
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PUBLIC BATHS AND HEALTH IN ENGLAND, 16TH-18TH CENTURY *

The relation between baths and health with its history of many hundred years has stimulated an extensive popular literature, ranging from the descriptive to the technical, the historical to the controversial, and the superficial to the exhaustive. On its foundation a history of English baths during some two centuries will be attempted. Perhaps such a sketch—essentially in the form of a bibliographical essay—will prompt the large, detailed treatment of baths that, in bulk and technical problems, the subject warrants. To date, relatively slight and limited surveys have supplied all our information, and their preoccupation with social history has failed to reveal, let alone to exhaust, the medical possibilities of the topic. After all, "bathing" should concern the historian of medicine as much as the angle-worm, and no aspersion of the angle-worm is intended.[1]

Although the Romans had popularized watering places in England, the millennium after their departure marked no advance. Alexander Neckham, to be sure, had praised the waters of Bath in the twelfth century, but his contemporary, Richard of Devizes, described the town itself as "placed, or rather buried, in the lowest parts of the valleys, in a very dense atmosphere and sulphuring vapour, as if it were at the gates of Hell." [2] As late as 1550 the fashion of taking the waters was not yet established, the subject had stimulated no literature, and Bath alone had a clientele. According to the itinerant Leland, that city was then a pleasant and fruitful place with a population of some 1200, on the calculation of three to five persons per house. During the next century the total increased no more than a few hundred. The city had a plentiful supply of water, with conduits in the principal streets, and the wells had recently succeeded cloth as the

* I am greatly indebted to the University of Missouri Research Council for assistance in preparing this essay.

[1] For the extensive pharmaceutical use of angle-worms see Axel Garboe, "The Angle-Worm a Detail Study in Popular Medicine," *Janus*, XL (1936), 43-48. A brief explanation of the method of citation is in order: small superior numbers apply to notes at the foot of the page, and those in parenthesis refer to the bibliographical list at the end.

[2] *Chronicles of the Crusaders*, c. 1204 (London, 1848). Two informative sketches, P. Rowland James, *The Baths of Bath in the Sixteenth and Early Seventeenth Centuries* (London, 1938) and Reginald Lennard, "The Watering Places," *Englishmen at Rest and Play: Some Phases of English Leisure, 1558-1714* (Oxford, 1931), have supplied historical and descriptive background. See also James Wigmore, *Medicine and Its Practitioners during the Earlier Years of the History of Bath* (Bristol, 1913).

basis of the town's prosperity. Their administration had passed from ecclesiastical to secular control, and the new management, at first private but afterwards civic, spent freely on improvements. Clean maintenance and effective direction quickly brought genuine popularity.

Under the inspiration of Bath's fame and the simultaneous inability of Englishmen to visit continental spas because of international unrest, other English watering places began to boom. Travelers gave these baths "honorable mention" and patients testified to their multiple efficacy. Occasional visits of royalty, added to bowls, tennis, and the theater, increased their appeal. As the baths drew the fashionable and wealthy they likewise attracted vagrants; and Parliament sought to exclude "sturdy beggars" and to check the economic upset attendant upon unemployment and feeding a community not on a natural waterway. Other problems, especially of a social nature, followed the influx of divers persons, since mixed bathing in the nude survived until after 1621. The search, pretended or real, for health soon inspired physicians to action, and after 1560 they strove to make balneotherapy as popular in England as it had long been on the continent. Moreover, they related bathing to other health regimens—dieting, moderate exercise, mild recreation, and music. A ritual of bathing emerged; laymen and physicians alike debated the merits of cold or hot baths; new wells were steadily opened up, each with its specific curative quality. During the Civil War watering places suffered setbacks through disorder or fear of royalist plots, but after 1660 peace and the great repute of continental spas with which exiles had had experience brought a lively revival.

Prosperity naturally created difficulties in respect to decent food and lodging, medical advice, and a sensible bath regimen, not to mention problems of economics and morals. Lodging-house keepers, quacks, light ladies, fortune hunters, pimps, and similar parasites thrived in such an environment. Women, while observing the rules of decorum, took advantage to display all—and perhaps more than all—their charms. Amorous intrigue flourished, as many a husband or wife found the bath a regimen not less excellent for concupiscence than for gout or the vapors. Great rivalry and bitter denunciation marked the devotees and beneficiaries of different springs. Drinking the waters as well as bathing was recommended, and in some instances the excessive claims of benefits to be derived affected the patients most adversely. If, however, some doctors were quick to prescribe baths for virtually every ailment, others soon appreciated that visitors must not rely exclusively on the waters. Indeed, rest and

change were as highly regarded as the baths themselves. By the end of the seventeenth century, then, mineral springs had attained wide popularity, and the extensive testimony of their value touches many aspects of medical history. The literature of baths assayed the medicinal, moral, social, and purely scientific features of the subject. Description and catalogues of cures shared a place with acute expositions of the chemical and mineral virtues of particular wells. Lively controversies then ensued. In addition to relatively technical treatments, private citizens often adverted to the subject in their correspondence and diaries; and innumerable references characterized novels and essays. No one familiar with the civilization of 16th-18th century England can long overlook the contemporary social and medical importance of spas.

In this respect England differed not at all from continental areas where except for an eclipse in the early Middle Ages baths had had a distinguished history for several centuries. Especially had they come into prominence from the twelfth century forward when numerous factors contributed to their advancement. The growth of towns, the greater mobility of population, the building of roads, and the stability of governments all correlated closely with the increasing popularity of baths. Moreover, as laymen sensed their values for relaxation and improved health, so scientific writers, notably physicians, began to consider balneotherapy ever more seriously, and the literature of medicine was correspondingly augmented.

The earliest works in England, though primarily descriptive, did not neglect technical problems. In 1562 Dr. William Turner (1) published what may well be regarded as the first English dissertation on baths.[3] He remarked that although Bath was the most famous English spa—having been developed by the Romans—excellent baths existed all over the country. Perhaps to stimulate English interest in baths, and as might be expected from a man who had traveled extensively and had studied with Conrad Gesner at Basle, he described at some length the various continental waters and their respective virtues. He praised the therapeutic value of Bath waters and recommended their better administration. The baths should be emptied and cleansed every twenty-four hours, and

[3] Turner (d. 1568), a cleric and botanist as well as a physician, had a lively career. His herbal inaugurated the scientific study of botany in England. He was chaplain and physician to Edward, Duke of Somerset. An intimate of Nicholas Ridley, the martyr, he engaged in sharp religious controversy, and as a Low Churchman he was so unconventional as to invite censure. In addition to the numerous issues of his Bath book there exists a MS. copy made in the 18th century, viii + 110 pp., 10 x 7¾ in. *Bibliotheca Osleriana* (Oxford, 1929), No. 7630.

separate baths should accommodate men and women and the variously infected. In conclusion he laid down several rules to be observed in all bathing regimens. People should eat moderately and take only digestible food on which they should spread spices; springtime was the preferred season; no one should remain too long in the bath, an hour being a good average; he must also avoid cold; a purge beforehand and a rest afterward were essential; patients should invariably keep chaste.

Ten years later John Jones published two works on the subject (2). In *The Bathes of Bathes Ayde* he listed fifty-one diseases, such as ulcers, pox, gout, palsy, cramps, coughs, " singing in the head," colic, wasting of seed, lack of memory, and diabetes, " the over making of water," which baths effectively cured.[4] He credited the discovery of the baths to the Romans, noting that the chief spring was dedicated to Minerva. According to Jones, patients should not use the baths in cold, windy, or rainy weather, in pestilent seasons, or "(says Savonarola)" [5] in leap year. About an hour after sunrise, if the ailment required, the patient—his body having been purged and digestion fulfilled and the water cleansed—might drink water from the spring. The bath should be used in good weather both morning and evening. After bathing the patient should go to bed and sweat, following this with moderate exercise. A light diet was desirable. Jones also included several recipes of which, by way of illustration, " a clister to mundify the blood " called for hops, fumitory, scabious, endive, chickory, roots of parsley and fennel, and gourd seeds, boiled in whey, adding thereto honey and salt, " a pretty quantity."

In addition Jones described the virtues of Buckston baths, and thus seems to have been the first to consider other waters than those of Bath.[6] These baths— the name resulting it was " not unlikely " from the practice of wounded bucks or stags taking refuge there—had had a long popularity. Located sixteen miles from Manchester and thirty from Stafford, they were reached by a paved road over the moors " of such antiquity as none can express." Moreover, the Earl of Shrewsbury had built a magnificent hall between the chief spring and the river " with a great chamber, and other goodly lodgings, to the number of 30." There were accommodations

[4] Jones's precise dates are unknown. He was presumably born in Wales, began to practice " by lawful grace of the universities " about 1560, and wrote on pediatrics as well as on medicine generally.

[5] Michael Savonarola, *De Balneis* (Ferrara, 1485, *et al.*).

[6] This work, later substantially incorporated in Thomas Short's *History of Mineral Waters* (1734), proved to that writer that Jones was no stranger to perspiration and circulation, though people, he says, often assumed that no one appreciated these factors before Sanctorius and Harvey.

for the poorest, seats defended visitors "from the ambient air," and fireplaces provided for the airing of garments. A physician was always in attendance. No wonder, under such circumstances, that in 1597 parliament forbade any one resorting to Buckston to beg inasmuch as the waters were much frequented![7]

In contrast to his Bath tract Jones here said nothing of drinking the waters, but the diseases cured by the Buckston springs were virtually the same as those cured at Bath. Bathing, however, was not enough. Sharp sickness required a most tender diet; "meeker sicknesses" allowed a larger diet. For the "crased" the best drink at Buckston was "mean ale." He prescribed "ordinary" flesh, forbade most fruits in many regimens, but permitted almonds, figs, chestnuts, quinces, rice, and raisins. The air, wholesome but sharp, required a plentiful supply of clothing. Patients could participate in some exercises and games provided they satisfied certain conditions. When one's urine resembled "clear running water," his juices were still raw, but when amber the juices were digested and exercise might be safely pursued. On arrival at Buckston people should tarry two or three days before entering the bath in order to rest and to get accustomed to the air. Thereafter their routine was the same as that which Jones had recommended for visitors to Bath.

In addition to Jones and the re-issues of Turner, Englishmen had other works at their disposal by the end of the century. In 1587 Dr. Walter Bailey (1529-93), Queen Elizabeth's physician, Regius Professor of Physic at Oxford, and the author of other medical works, brought out a short descriptive piece (3), as did two anonymous authors in 1600 and 1607 (5). Rather different in character but certainly not unrelated either to waters or to health was the first of some pamphlets on swimming (4). Christopher Middleton (1560?-1628), translator and poet, in a delightfully illustrated work declared that swimming, apart from its virtue as a life preservative, was "the fittest thing to purge the skin from all external pollutions and uncleanliness." Other works of this genre, though concentrating on the technical aspects, also inferred the health value of swimming.

Much more in the balneal tradition was the tract by the popular Bath physician, Tobias Venner (1577-1660), who published one of the most complete of the early analyses (6). He described first of all the four public baths and the leper's bath. The King's Bath was the hottest, and for beauty, size, and efficacy of its heat it was "a Kingly Bath indeed";

[7] 39 Eliz., c. 4.

Hot Bath was very much like the King's—good for both cold and moist diseases; the Queen's Bath, not so hot as the King's was connected with it by a passage; Cross Bath being only temperately warm was good for young, weak, and tender bodies and for contractions of any "member," obstructions of the breast, spleen, liver, and kidneys, and aches. Sulphur was the only mineral in the baths, which received their heat from sulphur burning in the cavities of the earth. Baths should be used only on the advice of expert physicians, and fit preparation by purging was essential. The neglect of proper "physick-helps" and regimen in bathing explained why some people failed to benefit from the treatment. Bathing in the cool of the morning in the summer, rather than in the spring or fall, aided diseases of a cold nature. The waters never lost their virtue, but the disposition of the ambient air might make them less efficacious at one time than another. Bathers sometimes suffered from weakness and subversion of the stomach; and faintness overtook some people especially if they were not strongly constituted.

Venner bitterly deplored the existence of houses advertising lodgings near the baths and extolling the virtues of one bath above the rest, and ready to furnish a physician, perhaps an empiric or upstart apothecary, to the visitors. "It were to be wished, that empiricks, and all others being not graduates in the faculty of physick were utterly prohibited to practise in the city." He advised doctors to take such good care of their patients that the latter would never seek out ill qualified empirics who often disgraced the medical profession by their mountebankery. Cautious use of baths and the counsel of a physician who best knew the state of one's body and health would secure the most satisfactory results.

Having given this advice Venner considered in a general way why the spring had a heavier mortality than any other season and related that phenomenon to the matter of baths. He concluded: 1) that the moisture of winter filled the body with crude and excremental humors which dissolved by the heat of spring putrefied in the body and caused sickness unless expelled by nature or physic; 2) that the inconstancy of spring with its sudden alterations produced feverish distempers and other infirmities. Purging the body and purifying the blood preserved a man in perfect integrity the whole year after. Those subject to fluxion and the choleric and thin should take physic at the very beginning of spring; others, about the middle. Physic was not necessary in the autumn, for summer did not prepare the body for sickness; yet persons naturally full of crude and phlegmatic humors should take some precautions. Again Venner warned

his readers not to expose themselves to the unlearned empiric: "It is strange to see the ignorance of most people, how backward they are to give the learned professors their due, ready to lay scandals upon them; but forward to magnify empiricks."

From such wisdom he turned specifically to the water of St. Vincent's Rock. This very pure and crystalline spring excelled any other for temperature and contained both sulphur and nitre. Though recommended only for drinking against the stone, all sorts of people, whether or not they had the stone, visited the Rock; because scarcely one in fifty had the judicious physician, the water would be disgraced. The well could not be good for all victims of the stone, and the ill and preposterous use would weaken the stomach, subvert the liver, annoy the head and breast, occasion cramps and pain in the joints, and breed crudities, coughs, dropsy, and consumption. The true use of the water was to cool inflammation of the inward parts without irritating the stomach and to counteract strangury and purulent ulcers of the kidneys and bladder. It was best taken in April, May, and June, and in the morning. In this connection Venner prescribed the rules concerning St. Vincent's water as a antidote against the stone and other bladder or kidney ailments. He stressed fitting preparation, consumption in the morning after a purge, a physician's advice on quantity, repetition for eight or ten consecutive mornings, the need for drinking the water at a temperature as near as possible to that at which it came from the Rock, the spring as the proper season and warm, dry weather, a slender diet, a purging after consuming the water, avoidance for children under twelve unless they were naturally of hot constitutions, and no consumption for those who could not pass it by urine.

While Venner's work was easily available in various forms in the 1620's, other writers also made their appearance. Edmond Deane (1572-?) described a Yorkshire spa in glowing terms (7), and Michael Stanhope, about whom nothing seems to be known, issued two tracts of medicinal value (8). In the compendious *Cures without Care* he began by citing Turner's belief that waters partaking of iron and sulphur and being cool and dry were proper antidotes for all kidney and bladder ailments, rheums, the short-winded, and "cold phlegmatic men that would gladly have children and have none." Where iron constituted the chief mineral, as in the Knaresborough Spa in Yorkshire, the waters cured all manner of itch, numbness, diseases of the joints, stiffness of the sinews, dizziness of the head, and gnawings of the stomach. Stanhope likewise listed "such persons as have received benefit or cure" by these particular waters, their

infirmities including ulcers, the stone, melancholy, shortness of breath, weakness of the limbs, swellings, worms, scurvy, and falling-sickness. These persons affirmed that they could, with more ease and less nauseousness than in the case of other waters, drink twenty glasses of the Knaresborough waters.[8] In common with other writers he freely advised prospective spa visitors:

> Undertake not thy self to judge of thine own body, what correspondence the water may have with thy infirmity, but repair to the learned physition. Being once resolved to use the water, fit thyself for it by taking a day or two before thou drink of it, some such apt preparative as best may suit . . . thy distemper. Resolve, during thy drinking the water, to keep an orderly diet, avoiding all meats of gross nourishment . . . and let thy meals be spare, especially thy suppers. Go to the fountain armed with a . . . warm garment. Attempt not to drink these waters, but with a prepared patience to attend the issue of their operation . . . a month at least. If . . . the water . . . appear to work effectually, cross not the course of it by an intermixture of any other physic.

Of distinctly greater importance in bath literature was Edward Jorden's *Discourse of Naturall Bathes and Minerall Waters* (9) which quickly had several issues and appeared in its third edition in 1669 under the auspices of the well known writer on baths, Thomas Guidott, whose own contributions will be summarized below. "There is nothing in our profession of Physicke more usefull, nor in the workes of nature more admirable," said Jorden,[9] "than naturall baths and mineral waters . . . sulphur is in such request . . . as they think there can be no hot bath without." Cooling waters reduced hot distemperatures of the liver, stomach, kidneys, bladder, and womb; heating waters counteracted cold tendencies in the stomach, bowels, and womb, and palsies; cleansing waters cured ulcers, and astringent waters the flux. These waters could be used either inwardly or outwardly, and some indeed could be made into broths, beer, and juleps. Many mineral waters, particularly those containing lead, quick-

[8] One particular example will suffice to illustrate Stanhope's account. In the year 1626 a woman "found herself surprised with extraordinary sharp fits, which . . . did appear to be the stone. Hereupon she applied herself to the physitians advice, but finding little or no ease by their prescriptions . . . she was persuaded to try the new water at Knaresborow, where she had not continued above a fortnight, but she voided many stones, to the number of a hundred, bigger and less, whereby she was quit of all her pain, and hath ever since continued in health."

[9] Jorden (1569-1632), a gentleman of good family, had an M. D. from Padua and was a Fellow of the College of Physicians. He experimented with alum, treated the wife of James I, and helped to detect a witch imposture when a man ordered his own daughter to pretend to be bewitched by a neighbor with whom he had had some difficulties. Jorden practiced first in London and later at Bath.

silver, gypsum, and arsenic, were fit only for bathing. Bathing in waters impregnated with these minerals together with the natural heat warmed the whole body, opened the pores, procured sweat, moved urine, provoked evacuations, strengthened weak parts, comforted the nerves, cleansed the skin, eased pains in the joints, and mollified hard tumors. While bathing the patient should keep his head well covered, " be quiet from swimming, or much motion, which may offend the head by sending up vapours thither," dry his body well, and rest in bed afterward for an hour. The morning, an hour or two after sunrise, was the best time for bathing, and the summer was the best season. A person should stay no longer than an hour in a hot bath or two hours in a temperate one. The treatment ought to be continued from twenty to thirty days or longer, according to the nature of the case.

Jorden, in discussing the mineral qualities of the waters, noted that the Romans had esteemed baths highly, but English waters being mineral were more reasonably adored. The minerals resulted from an infusion with subterranean mines, for the waters mixed with stone and earth, both of which contained various mineral substances, with bitumen (predominant in the waters of Bath), camphor, arsenic, cadmia (of the nature of copper), bismutum, antimony, bell-metal (a mixture of tin and copper), gold, silver, iron, copper, tin, and lead. The baths derived their heat from natural fermentations. Because there were different waters for differing ailments, a physician's guidance was essential. In this latter connection Jorden quoted Galen's remark that the art of physic

> goes upon two legges, Reason and Experience, and if either of these be defective, our Physicke must needs be lame. Reason without Experience makes a meer contemplative and theoreticall Physitian: Experience without Reason makes a meer Empericke, no better than a Nurse or an attendant upon sicke persons, who is not able out of all the experience he hath, to gather rules for the cure of others.

At about the same time Dr. Lodowick Rowzee of Ashford, Kent, called attention to a famous neighboring resort, the Queen's Wells (10). Far more eloquent if often less learned than the authors heretofore discussed, he quoted Hesiod, Hippocrates, and other ancients on the necessity of water in general. He divided waters for diet or physic into fountain-water, river-water, well-water, rain-water, and pond-water. The best and most wholesome water was pure, tasteless, and light (the lightness to be judged by the speedy heating and cooling). He mentioned waters with strange effects, as for example a fountain in Arcadia which protected conception and hindered abortion, and a river that caused barrenness in women.

Medicinal springs were commonly found in barren soil, and often the same spring cured many contrary diseases. Amid these reflections he threw in the statement that some called mithridate the father and treacle the mother of all medicines.

Of Tunbridge Wells in particular Rowzee mentioned two small contiguous springs surrounded by stony hills and called Queen Mary's Wells because she had visited them. Iron was their chief mineral, and patients were purged by stool, vomit, and urine. He would not recommend the waters unqualifiedly, but they were excellent for obstructions of the liver and spleen, and for the cure of dropsy, gout, black and yellow jaundice, scurvy, stone in the kidney, dysentery, convulsions, headache, hiccups, worms, and sore eyes. The summer when clear and dry and the morning when the sun was about an hour high was the best time for taking the waters. When the sun was too strong it attracted some of the mineral spirits and the waters lost strength; neither was rainy weather, when "Jupiter doth piss through a sieve, as Aristophanes merrily speaks," satisfactory.

The waters were to be taken in as small a space of time as possible. After each glass the patient should take caraway comfits, coriander seed, angelica root, or some similar herb, to help digestion and the passage of water. Tobacco held in the mouth for a time was also good. Although the water was an empirical remedy, it should be used with reason, discretion, and circumspection, and on the advice of a skilled physician. Moreover, all worries and melancholy should be left behind. Care should be taken of evacuations, including the "private excrements of the brain, at the mouth and nose." Patients must watch their diet and remember that ill humors coming from the use of bad bread were worse than those from meat. People should be content with one dish at a meal. "Many dishes bring many diseases . . . an unsatiable belly is a pernicious sink." Women who came to the waters for fruitfulness should refrain from mints. Rowzee concluded by recommending beef and mutton, chickens and fruit eaten sparingly. The best drink was good clear beer.

During the next thirty years spas got relatively little attention, since the Civil War, its aftermath, and the Restoration occupied the public mind. Nevertheless, some older works were reissued and a few new pieces made their appearance. In 1634 Dr. Tobias Whitaker [10] published a discourse (11), and the distinguished botanist, Thomas Johnson,[11] brought out his

[10] Tobias Whitaker (1600/1-66) is chiefly memorable for his conviction that wine was a universal remedy; he also wrote on smallpox.

[11] Thomas Johnson (1600-44), bred an apothecary and given an eight year apprentice-

Mercurius Botanicus which contained a section on baths, later reprinted by itself (12). In 1652 John French [12] analyzed the Yorkshire spa in chemical detail (13), and two years later there came an anonymous sketch of Harrowgate water (14). Such works indicated a continuing interest in "waters" and prefaced the great revival and expansion shortly to occur. After 1660 English affairs resumed a more tranquil course and as people began once again to visit baths and resorts in great numbers, descriptive and controversial literature abounded.

Scarcely less influential than political equilibrium in this revival was the active participation of the Royal Society. From the outset the members considered the qualities and merits of particular spas and the technique of analyzing waters. Controversies flourished, and the whole question received a thorough airing. Some contributors, it is true, were little more than enthusiastic local antiquarians and amateurs anxious to list the virtues of the waters in their neighborhood; but others were acute observers and a few indeed attained a high pinnacle in the history of science. Reports came into the Society concerning both continental and English spas, and though many of the papers today possess little scientific merit they have genuine historical value. If nothing more, they reveal to what extent balneology had captured not merely the popular but also the learned imagination.

Two of the most prolific commentators—about whom unfortunately it seems impossible to uncover much personal data and who clearly would repay investigation—were Doctors Robert Wittie (1613-84) and William Simpson,[13] who at a moment's notice would engage in lively contention with one another and with anyone else whose opinions aroused their dissent. Wittie began his contributions in 1660, and continued to speak his mind very freely for the next dozen years. He described the chemical nature and medicinal value of the Scarborough spa at great length and in minute detail, discoursed on balneology at large, and defended Galenical

ship, was definitely launched on his botanical career in the mid 1620's. He traveled extensively throughout England and listed many new plants. His popular and valuable edition of John Gerard's *Herbal* gave him his reputation, but his own *Mercurius Botanicus*, the first English flora, was his important contribution; he also brought out a translation of the works of Ambroise Paré (1634). He was killed in 1644, a lieutenant-colonel in the army of Charles I. H. W. Kew and H. E. Powell, *Thomas Johnson, Botanist and Royalist* (London, 1932).

[12] French (1616?-57) graduated A. B. and A. M. Oxford and later became a physician in the parliamentary army; he wrote several works on medical chemistry.

[13] Both men were obviously Yorkshiremen. Simpson practiced at Wakefield, Yorkshire: he claimed to have invented a "universal character" before Bishop Wilkins.

medicine against the Paracelsians. He fought with Simpson, Foot, Tonstall, and Highmore.[14] These men in turn refuted his ideas both before the Royal Society and in the public forum (15, 19, 152).

Easily the most learned of his opponents was William Simpson, " Philo-Chymico-Medicus," who combined extensive knowledge with a vigorous, almost evangelical, zest for controversy (16, 150). Interspersed with his animadversions on Wittie was a discourse on the origin of hot springs and other fountains, " with the causes and cures of most of the stubbornest diseases (either chronical or acute) incident to the body of man." He vindicated chemical physic by propounding as a " probable way " for the improvement of experimental philosophy the foundation of " a real Science of Experimental Physiology." In testing the Scarborough Spa he found it impregnated with mineral salts other than the vitriol, iron, alum, nitre, and salt mentioned by Wittie.[15] Because the latter had failed to distinguish between iron and copper vitriol, Simpson included a long technical discourse on the mineral qualities of the water. Under such circumstances few lay contemporaries would have read him in order to discover where to take the " waters," especially since he never regarded them as a universal panacea. He applauded the Paracelsians, above all, Paracelsus and his *Aurum Horizontale, Mercurius Fixus Diaphoreticus,* and deplored the Galenists. Admitting more than a touch of the alchemist and of the enthusiast, the conviction that Simpson was genuinely important in the history of medicine cannot be entirely smothered.

Meanwhile some early anonymous contributions to the Royal Society described the character and praised the efficacy of several German springs (146). One was good against epilepsy, diseased spleen, and worms, but it was so strong that birds died in convulsions after drinking it. Another, operating both through drinking and bathing, tasted well and was very wholesome;[16] tanners used it in their business. A third, very oily, was easily reduced to a paste for cutaneous abrasions and, taken inwardly,

[14] Nathanial Highmore practiced at Oxford; he wrote among other things a *History of Generation.* I have found nothing about Daniel Foot and George Tonstall. The editors of the abridgment of the *Philosophical Transactions* are much too scornful in their comments on these men and their works. However faulty the chemistry, it is not enough to dismiss these books as containing " nothing worthy of notice " or as " a minute, but uninstructive analysis," or to say that " to particularise the contents of these tracts, would be an abuse of the reader's time and attention."

[15] Highmore doubted the existence of alum in Scarborough and cited an experiment to prove his point; he found the Dorset spring chalybeate.

[16] The author declared that it contained antimony, but the editors deny this, saying that if it had, it could not have tasted well or been wholesome.

benefited palsies, consumptions, giddiness, and headaches. A fourth, salt in character, was excellent for bathing, and a spirit extracted therefrom cured putrefaction of the lungs, liver, and spleen. Three other items, continental in origin, may also be treated here. The first, a letter from Danzig (149), sought information about a "liquor" to dissolve the stone and ease the gout. The author professed to have tried warm mineral springs to advantage and to have concocted for bathing purposes a liquor resembling these mineral waters. A second communication, by Edward Brown,[17] described the baths of Austria and Hungary, supplying a chemical analysis of ten different baths and sketching the regimen followed there (153). A third characterized the Aponensian baths near Padua as very hot and stinking but yielding a fine salt and highly recommended by the natives (154).

During these same years Dr. Beale of Yeovil,[18] Somersetshire, was contributing several observations to the Society (148). He noted that some local waters had long enjoyed fame for healing eyes and were good for ulcers. He inquired concerning salt springs and their qualities, and went on to offer his own suggestions at considerable length. Rather more learned was the offering of Joseph Glanvill whose interest in balneology grew out of his studies on the Mendip mines.[19] He described the country around Bath, pointing out how it abounded with hot and cold springs, how the west wind made one bath cold whereas the east made it hot, and how the most bubbling springs were the coldest. He recalled that Bath was said to have been known as early as 800 B. C., and credited the legendary King Bladud with having made it famous; oyster shells had been found there seven or eighth feet underground. He gave the chemical constituents of the baths, some of which contained sulphur, others nitre and alum. The bath provoked urine and cured scurvy, gout, and diseases

[17] Edward Brown (1642-1708), the able physician to Charles II and president of the College of Physicians, had traveled extensively through the Habsburg dominions. According to Charles II he was one of the best bred men in England.

[18] Dr. John Beale (1603-83) was a man of excellent parts, extensive learning, and public spirit. He traveled widely and, among other enterprises, promoted the planting of apple orchards. The editors of the *Phil. Trans.* are again unnecessarily supercilious in describing one of his contributions as "prolix in the extreme, and wholly uninstructive." *Cf.* Samuel Hartlib to Robert Boyle: "There is not the like man in the Whole island, nor in the continent beyond the seas, so far as I know it—I mean, that could be made more universally use of, to do good to all . . ." Boyle, *Works*, V, 275.

[19] Joseph Glanvill (1636-80), clergyman and philosopher, chiefly memorable for his *Vanity of Dogmatizing* (1661). His contributions on the Mendip mines may be found in *Phil. Trans.*, II, 525, 767; Abr.: I, 186, 276.

of the head, skin, and bowels as well as those of women and children. Bath guides notoriously lived to a great age (151).

The year 1669 saw the literary advent of Thomas Guidott, the most prolific commentator on baths in these years, Wittie and Simpson apart.[20] He edited, observed, and theorized (17, 36). His first contribution was an edition of Jorden to which he added an account of the history of Bath and of the nature and virtues of its waters. This material he greatly amplified in succeeding works, and on one occasion he ventured to discuss another well-known resort, Sadler's Wells. Not only, moreover, did he discuss baths, but now and then he indulged in an attack upon " this loose and quacking age of ours, in which Empericks and juggling Medicasters do so much abound." So many people thought " a pack of receits " alone necessary to practise medicine, but there were many significant things in philosophy known and studied by physicians. " A Compleat Physitian " stood " on the two legs of Anatomy and Herbery," surgery and pharmacy.

So far as Bath waters were concerned, Guidott was descriptive rather than medical in the narrow sense. He supplied a detailed chemical analysis of their constitution, refuting the contention of the physiologist, John Mayow,[21] that the waters contained no sulphur or nitre (21). He complained that, even though unsurpassed throughout the world, the baths had remained a long time in obscurity. Except for Turner, Jones, and Jorden, what had been written was scarcely worth mentioning, but " little

[21] Thomas Guidott (1638- ?) in his *Discourse of Bathe* (1676) asked the following questions: " Whether the Bath-waters ought to be drank Hot, or Cold? Whether in great or little Quantity? Whether it may be drank at Meals? Whether Bathing or Drinking may be done the same day? Whether Drinking may be in the morning, and Bathing in the evening of the same day? Whether the Bath-water ought to be taken many days together, or else some days to Bathe, and others to Drink? Whether large Draughts may be taken, or more moderate; and what time is required should be between the Draughts? How many days it is convenient the Bath-water should be drank? Whether any Medicines may be usefully taken with the Waters, to further their operation? What times of the year are most proper to Drink it in? Whether the Bath-water may be taken in Winter? Whether the Leap-year hath any malign Influence on drinking the Waters? Whether the Waters may be safely used in the Dog-days? Which is first to be done, either Bathing, or Drinking? " For some attention to Guidott, consult Finley Foster, " Bath: Physicians and Literature," *Bulletin of the Medical Library Association*, XXXII (1944), 9-11. This article (*loc. cit.*, 2-22) provides an informing sketch of Bath history from the legendary period to the end of the 18th century. Guidott started at Bath under the patronage of Dr. John Maplet (1615-70) whose work on Bath waters he later edited.

[21] Mayow (1643-79), chemist and physiologist. For a critique of his puffed-up reputation see the excellent analysis by T. S. Patterson, " John Mayow in Contemporary Setting," *Isis*, XV (1931), 47-96, 504-46.

dogs must piss." He himself had analyzed the waters and recommended that they should be freed from the foreign substances which harmed digestion. Alongside its medical value Guidott noted that Bath water made better writing ink than any other water. For all his words and pretensions, he was a confused writer who actually contributed little to the history of "waters."

The expanding interest in balneology in the 70's manifested itself alike in additional attention to old resorts, in advertising new ones, and in general theoretical essays. A new spa at Latham, Lancashire, the happy effects of which he had recently observed, aroused sufficient enthusiasm in Edmund Borlase [22] to prompt his writing a description of its beneficial character (18). He had found the people thereabouts to be of healthier constitutions and less subject to the "epidemical distemper of this year, which hath so miserably infected most places." The water, which had "a blewish cream, or skin which swims" upon it, dyed the pavement with a rusty iron color. Some thought this skin to be liquid amber, others believed it to be sulphur. The spa worked "most by urine, often by urine and stools, sometimes by vomits." Some persons favored drinking the water warm, "the stomach being apt to suffer by the contraction" cold water might make on the nerves. Exercise while taking the waters was most necessary, and "riding, shooting, bowling, or what may make the water more easily descend, and inlarge its distribution" were highly recommended. Among the cures effected were the passage of stone and gravel, kidney ulcers, colic, "old aches, and inward and outward sores," tumors, dropsy, asthma, scurvy, worms, "women's diseases," and gonorrhea. Additional sketches of interest came from Chapman (20), an anonymous E. W. (22), and Pugh (23, 155), all expressing in various ways the urge to health and happiness.

In addition to the specific bath tracts, contemporaneous works on natural history usually included sketches of springs (24, 155, 156, 161, 165). As might be expected, such pieces were largely descriptive, though all these particular authors, Robert Plot, Charles Leigh, John Morton, and John Aubrey, had scientific knowledge.[23] Plot found the healthiness of Oxford-

[22] Borlase (d. 1682) held medical degrees from Leyden and Oxford and practiced at Chester and Bath. He may also have been the author of *A Farther Account of the Latham Spaw.*

[23] Robert Plot (1640-96), antiquary, first custos of Ashmole's Museum, professor of chemistry at Oxford, and secretary of the Royal Society; Charles Leigh (1662-1701?), naturalist, M. D., and F. R. S.; John Morton (1671?-1726), clergyman and naturalist, F. R. S.; John Aubrey (1626-97), antiquary and biographer.

shire waters to result from their impregnation with salts and sulphurs. Staffordshire had many medicinal wells where " divers strange unaccountable cures " were performed, and where, in grateful memory for the good they had formerly done, the people adorned some wells at certain periods of the year with green boughs and flowers. The successful use of medicinal waters, however, depended much upon the method, " which unadvisedly administered will do no cures." Leigh, in providing full descriptions of the location and qualities, praised the mineral waters with their salts which were mildly laxative, of the Lancashire region. Although he seemed to follow Floyer (who will be discussed below) in a preference for cold bathing, he also regarded the hot springs as excellent for the same purpose.

Morton stressed the purity of the Northamptonshire waters but warned that even the clearest water was far from being pure. The more constant the springs, or the less they depended on rain, the purer they were likely to be. One purging spring, Red-Well, had been known as early as 1626 when Charles I and his queen resided there for a season. Its virtues had not been impaired in after years, but mismanagement had damaged its usefulness. The famous medicinal water, New-Well, was strongly recommended by skillful physicians as being particularly curative in cases of the stone. Morton also listed numerous kinds of mineral waters. Aubrey, who leaned for his technical knowledge upon other writers, notably Benjamin Allen, referred to the discovery of a medicated spring in Surrey about 1639 by some laborers who accidentally drank it. It purged very well and was beneficial up to the ages of 45, or 50, but not afterward.

More in the tradition of balneotherapy were works like Stubbs' edition of Hall (25) and the tract by John Peter (26).[24] The latter described a well, discovered in 1648 and consisting principally of nitrous salt, alum, and sulphur. It purged strongly, sometimes causing a vomit, opened all obstructions, and was good for dropsy, scurvy, and green-sickness. It fecundated the womb and remedied barrenness. It extinguished inflammations, sweetened sharp humors, cured the gout and all sorts of worms, strengthened the brain, made fat bodies lean and lean bodies fat. Used outwardly it cured scabs, pimples, and the itch, ulcers and tumors. The water should be drunk but once a day, better warm than cold. A person should start with about three pints, gradually increasing to eight or nine,

[24] Hall (1575-1635), physician and Shakespeare's son-in-law. The work here listed was first issued by James Cooke in 1657; a second edition came out in 1679 and a new issue in 1683. Henry Stubbs, Stubbes, or Stubbe (1632-76) had a large practice at Bath. All I know about John Peter is that he was the father of Charles Peter or Peters (1695-1746), a distinguished physician.

and then tapering off. He should drink slowly, walking a little between drinks. He should not stand in the sun or sit on the cold ground. Finally, while taking the waters and for a month or so afterward, the patient should be temperate, even spare in his diet.

Much more learned were the contributions of Martin Lister (27, 155), but those of Haworth (28), Walker (29), the anonymous author of the *Exclamation from Tunbridge* (30), DuClos (31, 155), and Byfield (32) were essentially popular and descriptive pieces.[25] The communications of Todd (157), Petty (158), and Robinson (159) to the Royal Society contained some medical hints along with their discussion of chemical properties.[26] Robert Boyle, who had earlier put some inquiries concerning the medical virtues of the sea, especially against hydrophobia, to the Royal Society (147), submitted to the public in 1684 a prospectus for studying mineral waters (33, 161).[27] "He that would draw up the History of a Mineral Water," said Boyle, "should, in my opinion, make three sorts of observations about it." He should examine it in its "native receptacles," analyze its properties and qualities, and consider its effects on the human body. He should also take into account the climate, latitude, location (on a hill or in a valley), the minerals in the soil, heat or coldness, and specific gravity.

Again more in the popular vein was the essay on Tunbridge by Patrick Madan, M. D. (34). In his opinion these waters were not inferior to any in medicinal benefit; impregnated with a vitriolate juice which, with its sulphureous particles, irritated and moved the belly to a blackish excretion, and, by frequent drinking, blackened the tongue, they provoked urine plentifully. To his own judgment Madan added those of Sydenham and Willis, the former attributing the water's virtues to iron.[28] These waters

[25] Lister (1638?-1712), prolific, learned, and varied writer on scientific subjects, was created M. D. at Oxford on the recommendation of the chancellor. Samuel Haworth, an empiric who dealt in tinctures and tablets, was patronized by the Duke of York, later James II; his was a Turkish bath, aided by rubbing and artificial mineral water. Samuel Duclos (d. 1715), physician to Louis XIV, was mainly interested in medical chemistry. Walker, Byfield, and the author of the *Exclamation* are unknown to me.

[26] Todd (1658?-1728) and Robinson (d. 1719), clergymen and naturalists. Sir William Petty (1623-87), perhaps the most versatile man of his time—scientist, musician, economist, social reformer—and distinguished in whatever he concerned himself.

[27] Boyle (1627-91) requires no comment.

[28] Madan is unknown to me; Sydenham (1624-89) and Willis (1621-75) were of course two of the most famous physicians of the day. Tunbridge, be it remarked, was at this time most popular, largely because of proximity to London and the frequent presence of royalty. Pepys and Evelyn and the *Memoirs* of Count du Grammont (1664) amply bear this out. The latter notes the excellent appurtenances and entertainment of every sort, "high stakes and love-making in abundance."

with their "saponary and detersive" quality cleansed the whole body of man of all impurities, by stool, urine, and transpiration; "sending forth from the center to the circumference many sooty and fetid effluviums, which, in some, colour their skirts blackish." They restored men to life; physicians when they had tired "their miserable afflicted patients with tedious courses of physick" at last sent them to these waters, which they laid hold of "as a sacred anchor, for they are the most efficacious remedy against the greatest and most inveterate diseases . . . provided they are made use of in a due and right manner."

Madan recommended the waters for scurvy, hysteria, hemorrhages, obstructions of the liver and spleen, and barrenness, but opposed them for rheumatism, hectic fevers, or consumptions. Old people should use them moderately. The regimen called for drinking the Epsom waters every morning for three or four days, to purge and prepare the body for the Tunbridge waters. Then drink these leisurely for an hour or more, walking between times "till you look red, but not sweat"; take thus for a month or six weeks. The waters should not be drunk if it rained. Caraway and other candied seeds, a glass of small white wine, tobacco or tea leaves (in a pipe), taken in bed without sleeping, were commended to those who did not pass the water easily. Patients should avoid gross meats, fried and pickled foods, milk, roots, fruit, and all fermented drinks except wine, all excesses and debauchery: "Drink to live, but not live to drink." They should not observe fast days but should fast three or four hours after drinking the waters. They should change their linen frequently, take a gentle medicine every fourth or fifth day when drinking the waters, banish cares and listen to charming music.

Passing by Thomas Ken's prayers for Bath patients (35) and St. Clair's translation of Ramazzini's book on wells (38, 166), we may give some attention to the tract by the distinguished Nehemiah Grew (37, 163).[29] The Epsom spring was discovered in 1618 when a farmer enlarged a water hole for his cattle, only to find that they would not drink from it. The spring reached the height of its popularity by 1690, which no doubt prompted Grew to study its nature and uses, to discover what ailments it helped, and what others it harmed, and to separate the salt from the water. Although the spring declined in favor after 1700 John

[29] Thomas Ken (1637-1711), Bishop of Bath and Wells; I have found no data on St. Clair; B. Ramazzini (1633-1714) is best known for his study of occupational diseases and his work on the cattle distemper. Grew (1641-1712), plant physiologist and secretary to the Royal Society. See also E. W. J. Neave, "The Epsom Spring," *Isis*, XXXIV (1943), 210-11.

Toland noted in 1711 that it was still much frequented for its healthy air and curative waters (49).[30]

Again in the more popular tradition was Robert Peirce who in 1685 had communicated an instance of two specific cures to the Royal Society and was altogether glowing in his praise of Bath waters.[31] He himself had had every disease in the calendar of diseases and perhaps felt that he could speak with authority (39, 160). According to his experience Bath waters cured " aches and pains in several parts," whether " wand'ring pains," " fix'd pains," " fix'd pains in the arm," " dead palsie," " palsie after the cholick," or " scorbutical palsie," not to mention such conventional ailments as green-sickness, king's evil, sterility, barrenness, palpitation of the heart, miscarriage, diabetes, jaundice, lameness, cutaneous disorders, stomach pains, difficult swallowing, dislocations, sharpness of urine, stone and gravel, as well as many other cases " to shew how many and how strange infirmities our crazy carcasses are here lyable to."

By contrast, as befitted correspondents of the Royal Society, the communications of Beeston (164), Cay (167), and Geoffry (168) were more sober.[32] The first described a hot bath in Jamaica which cured stomach disorders, the pox, and ulcers, and which, along with many nearby springs, contained minerals. The second confined himself almost entirely to chemical analysis. The third supplied not only an analysis of the waters but listed the diseases, notably palsy and hysteria, which they relieved; they operated by bathing and drinking.

Meanwhile, 1697 saw the first appearance of a famous work, Sir John Floyer's *History of Cold Bathing*, which was to have six editions in thirty-five years (40).[33] The author began by noting the recent revival of many ancient medical practices, for example, copious phlebotomy; now the taking of the waters, especially cold bathing which the oldest authors approved, had come into favor. His enthusiasm for this treatment even led him to defend the therapeutic value of baptism. Cold bathing had gone out of fashion for some time because chemical doctors had discouraged the practice in order to get patients to take their internal medicines. Disuse had also resulted from the religious changes of the sixteenth century, since the virtues of many wells were imputed to various saints who were

[30] John Toland (1670-1722), chiefly remembered as a deistic writer.

[31] Peirce (1622-1710) settled at Bath in 1653 where he built up an extensive practice; he had a fair reputation as an observer.

[32] Sir William Beeston (1636-17?), lieutenant-governor of Jamaica. I have found nothing on Cay and Geoffry.

[33] Floyer (1649-1734) wrote extensively and was greatly interested in the pulse.

no longer worshipped. The unnatural regimen of recent years—spices, tobacco, and hot baths—had encouraged pleurisies, rickets, rheumatisms, and similar ills. Cold bathing was fitting for Englishmen because in a cold climate it meant less change from the bath to the environment. Beasts profited from cold bathing; man should also. Floyer was not so committed to cold bathing, however, as to believe that it cured all ills; asthma and decayed viscera required other treatment.

Ancient history testified to the antiquity of cold bathing; the Egyptians, Greeks, Hebrews, Romans, and Gauls had all practised it, and the early history of England revealed the same story. Such a situation prompted Floyer to supply a table of the various cold baths of England with a discussion of their chemical properties. He also outlined the correct regimen to precede cold bathing—bleed, purge, diet. One should not bathe while too hot or stay in too long or bathe immediately after a meal; he should bathe regularly. To bolster his contentions Floyer cited both Hippocrates and canon law to show how many baptized infants had avoided disease. He likewise enumerated the various cures by cold bathing, including the testimony of Galen as well as John Locke's recommendation that it was good for corns. Edward Baynard, by contrast, emphasized the value of hot baths and listed remarkable and numerous cures of every sort.[34]

The turn of the century saw several pieces. Benjamin Allen surveyed in a comprehensive fashion the mineral waters of England (41, 169); Ned Ward sprayed his somewhat scurvy comments over the social character of Bath (42); Joseph Browne supported Floyer's enthusiasm for cold bathing and explained the curative virtues of numerous spas (43); and an anonymous author published a guide to health through bathing (44).[35] William Oliver the first issued an extension of a communication he had earlier presented to the Royal Society on waters as an antidote to fevers, following this in 1707 with a more general dissertation on Bath waters which was to go through several editions in the next half century (45, 162).[36] In this latter tract he traced the history of Bath as a health resort, listed the ingredients of the waters, making much of their various salts, explained that their heat came not from subterranean fires but by

[34] Baynard (1641-17?) practiced at Bath after 1675.

[35] Edward Ward (1667-1731), a coarse humorist, also wrote *A Walk to Islington;* Joseph Browne opposed Harvey's theory of circulation, libelled Queen Anne, and wrote on the plague of Marseilles. For Allen, consult Robert M. Christy, *Dr. Benjamin Allen, 1663-1738, of Braintree* (1911).

[36] William Oliver (1659-1716), physician at Chetham and Royal Hospitals, also wrote on fevers.

fermentation, prescribed a regimen, stressed the value of the waters for gout and for women's and children's diseases, and praised both hot and cold bathing.

Whether because of the War of the Spanish Succession or merely through coincidence, these years produced an extensive literature on the subject. In 1706 the *Philosophical Transactions* published an analysis of a German spa (170). Mildly sulphureous and saline in taste, the water was temperate in summer and warm in winter. It healed ulcers, braced relaxed nerves, and cured scabs. The following year another communication described a Canterbury mineral water which, though not very pure, was excellent for diseases of the breast, scurvy, ulcers, and agues (171). It worked by urine and a gentle purge. In this same year, 1707, Andrew Brown gave advice on cold baths (46), Jeremiah Wainewright published an inquiry into the nature and use of baths (47), and John Quinton brought out the first of his several works on mineral waters and their medicinal value (48).

For a few years thereafter the public had to depend on new editions of older works but it was not long before new pieces began to appear. Slare described some German spas and analyzed some English waters (172).[87] He preferred Pyrmont waters to others because they purged mildly and the mineral was perfectly mixed. They retained their virtue a long time and cured obstinate distempers; patients should maintain a moderate regimen and avoid exercise. Nevill found some Irish waters that possessed healing qualities particularly for ulcers, rheumatism, and fluxes, and that offered a pleasant bathing place (173). He noted that farmers often drove their cattle to these waters. From Germany came a report of an individual whose urine was suppressed after excessive consumption of Pyrmont water (174). When, after an interval of abstinence, he renewed his drinking of the waters he voided stones; the author supposed that the water produced the stones.

In the meantime there had also come from Germany a treatise on Spa water by Dr. Edm. Nessel, a work translated from the French and dedicated to the College of Physicians (50). The author complained that the waters of Chevron and Brue, near Liége, were being transported into England and other countries under the name of Spa waters "to the disgrace of these last and the prejudice of physicians." He desired therefore to furnish such information as would prevent physicians being imposed upon in the choice and use of different sorts of waters sent to England

[87] Frederick Slare (1647?-1727), physician and chemist.

under the name of Spa. To that end he included a certified statement by the magistrates of the Spa territories that a certain Henry Colchester, druggist of London, had for several years exported great quantities of the true Spa waters into England "with all precautions imaginable." Nessel also enumerated the virtues of Spa waters and listed cures of kidney and bladder ulcers, barrenness in women, dysenteries, scorbutic hemorrhages, scurvy, jaundice, catarrahs, and all sorts of worms.

Although primarily concerned with gout, George Cheyne included in his essay on that disease his own observations on Bath waters (52).[38] These waters illustrated the wisdom of Providence in furnishing "an antidote to almost all the chronical distempers of an English constitution and climate," which chiefly resulted from errors of diet, rankness of the soil, richness of provisions, living so much on meat, inconstancy of the weather, and "indulging in sedentary amusements, or speculative studies." For the "chronical distempers" Bath waters were a sovereign restorative. They benefited gouty persons because they contained sulphur and other curative elements. Their warmth, moreover, just suited the wants of nature, being a little above the heat of the human body and therefore encouraging circulation by relaxing the stiff fibres. Their taste was agreeable. They were good for jaundice, scurvy, stone, hysteria, melancholy, rheumatism, digestive disorders, morning sickness, barrenness, and difficult menstruation. Ill persons ought to supplement the waters with other medicines, and consumption should depend on the individual. Five pounds a day were ample, and some persons believed that only small quantities should be taken at one time. While recovering from a fit of gout, cold bathing was excellent in that it stimulated the victim.

Considerably less medical in character though not without some health references were some verses of this period (51, 58).[39] The *Description of Bath* warrants partial quotation:

> To sing the Town where balmy Waters flow,
> Those sov'raign Springs which cheerful Health bestow.
> . . . . . .
> The Prince, diseas'd with Leprosy impure
> By Heav'n directed hither, found his cure.
> . . . . . .

[38] Cheyne (1671-1743), physician, philosopher, mathematician, and wit, stoutly advocated a strict dietary regimen in his numerous medical writings. He recommended visits to Bath to his patients.

[39] See also P. Causton, *Tunbrigialia* (1709) and John Byrom (1691-1763), "A Description of Tunbridge, in a Letter to P. M. Esq." in *Works* (1773), verses, Latin and English, extolling Tunbridge Wells. Byrom also wrote a verse, "On Inoculation."

Where floating Sulphur meets dissolving Steel,
And heat and combat 'till the Waters boil.
Then both unite and swim along the Stream
Give the Sick Health, and to the Waters fame.
. . . . . .
To thee foul Scurvy, odious to the sight;
And Vapours which in every Form affright;
And Leprosy of old Aegyptian Race;
And Cholic groaning, with a Jaundice Face;
The shaking Palsy; Rheumatism lame;
And meagre Indigestion, pining came,
With many dreadful Ails without a Name.
The waters have recall'd the fleeting Breath,
Repriev'd the Wretch by him resign'd to Death.
Giv'n Vigour to the Spirits, Ease from Pain,
Made the Lame walk, and clear'd the clouded Brain.

More prosaic and somewhat off the true balneal path were a series of tracts, some of them strongly controversial, debating the value of common water for various distempers, notably fevers (53, 54, 55, 177).[40] According to most of these writers, plain cold water would cure such ailments as gout and sciatica, stone, palsy, colic, catarrh, indigestion, headache, toothache, backache, inflamed eyes, pimples, numbness, strains, bruises, swellings, and green wounds, including mad dog bite. Heyden, who believed that bleeding and purging should accompany the use of water, concluded with a couplet from Ovid:

In vain the knotty Gout to Physick flies,
Water alone the certain Ave supplies.

The strong and comprehensive recommendations for common water did not, however, destroy interest in mineral waters. John Winter brought out two tracts on Bath waters and the diseases they cured (56). Lewis found some Wiltshire wells diuretic and excellent for scorbutic and scrofulous cases (175). Martyn described Buxton well and, later on, gave the history and chemical constituents of Dulwich spring which operated as a purge and diuretic (176). John Medley surveyed balneology in a more general way (59).[41]

Notwithstanding such contributions no writer in the 20's and 30's

[40] John Smith, clockmaker and philomath, "flourished" in the late 17th and early 18th centuries and was a widely read author. Heyden (1572-1650), and the others are unknown to me.

[41] John Martyn (1699-1768), botanist. I have no data on Winter, Lewis, and Medley.

exceeded Thomas Short in importance (57).[42] His publications ran over forty years and ranged from accounts of particular springs to exhaustive general surveys. With all his enthusiasm, however, Short was quick to admit that medicinal waters were not equally serviceable for all and that some people never could be cured. This want of success might result from unseasonable or irregular use of the waters or from an intemperate diet in meats and drink. When age, fury, or ungoverned passions had so contracted and shrivelled up the springs of the human machine that they were no more flexible, or where great obstructions of the glands occurred or mortal hemorrhages were poured out into the ventricles or deep and long inflammations caused putrefaction, what could physic, mineral waters, or doctors do?

Bath and Buxton challenged "the precedency of the whole mineral waters of England." Buxton water in particular was rarefying, heating, relaxing, thinning, sweetening, and a little drying. It especially benefited cases of gout, rheumatism, arthritis, cramps, convulsions, bilious colic, dry asthma, want of appetite, and indigestion from intemperance. The particular lightness and purity of the waters justified their use by all ages and both sexes, and women with child (except in the first and last months). However, young people "very full of blood and juices which run with a rapid course in their vessels" should use them cautiously between the ages of 23 and 30; the sanguine and phlegmatic should also beware. Short opposed preparing the body for the baths by the use of strong purges; much to be preferred were such simple laxatives as rhubarb, cream of tartar, and manna. He likewise recommended a gentle vomit. Young persons with plenty of blood should be "blooded" first. Of the purging chalybeate waters, he praised most highly those of Scarborough, Malton, Aswarby, Stenfield, Orston, Retford, Walcote, and Semperingham. The most noted and ancient diuretic chalybeate water was Harrogate spa.

Although Short may have been the most important writer of the thirties and forties he was by no means unique, for indeed a veritable freshet of tracts appeared, the authors in most cases using a particular spring as the starting-point for some general reflections. Peter Shaw described Scarborough quite elaborately and in so doing promised to resolve all the differences of several decades before between Wittie, Simpson, and their opponents.[43] According to him there were two wells, differing in taste,

[42] Short (1690?-1772) was a careful student with a wide range of interests in the field of preventive medicine and vital statistics.

[43] Shaw (1694-1763) was practicing without degree or license in London by 1726, but

the one more purgative and the other more chalybeate, but having many curative virtues in common (60). A similar approach, with of course particular qualifications, characterized the works of Soame (61), Atkins (64), King (65), Taverner (66), Keir (67), and Shebbere (68).[44]

The *Philosophical Transactions* continued to reflect current interest. Charles Perry, who had earlier published some general comments on waters and was soon to analyze Stratford mineral water (62), contributed an account of some springs in the Near East (181).[45] He found that the Tiberiades water helped circulation and digestion and cured rheumatism, dropsy, and jaundice, that the Hamman water, though frightfully nauseous, was excellent for bathing. It promoted virility and fecundity and aided gout, nervous diseases, epilepsy, and indigestion. Gilkes communicated some observations, primarily geological, on Matlock (178); Hankewitz found Westashton waters very good chalybeate (179); and Senckenberg discovered Glaubers and Epsom salts at Cheltenham (180).

The ordinary bath tracts continued to be issued steadily throughout the forties. In 1742 William Hillary published an interesting account of Lincomb spa, near Bath (69).[46] A workman had accidentally discovered this spring and analysis revealed it to be chalybeate. Hillary noted its chemical reactions on various substances; its effect on nearby stones was to make them porous. Marcasite was its chief impregnating principle; the smell was variable, the temperature about 52, and the specific gravity heavy. Although more sulphureous than Bath waters the odor disappeared quickly; the water was aerated and had only a small quantity of salt. It procured a quick appetite and passed through the body very

in 1740 received a license from the College of Physicians; he wrote extensively on chemical subjects and was widely read. Shaw was also responsible for *New Experiments and Observations upon Mineral Waters, by Dr. F. Hoffman, extracted from his works, with notes.* Friedrich Hoffman (1660-1742) was a very distinguished German physician and chemist.

[44] John Atkins (1685-1747), a naval surgeon; John King (1676-1728), an apothecary; Shebbere (1709-88), chiefly a political writer, claimed a medical degree from Paris and wrote at least two books on medicine. Soame, Taverner, and Keir have eluded me though the first also wrote *The Nature of the Plague at Marseilles* (1722). To this group of works on Bath and other waters should be added: John Andree, *An Account of the Tilbury Water* 1737; 5th ed. 1781). Andree (1699?-1785) wrote on epilepsy, cancer, and inoculation; he shared in the founding of London Hospital in 1741. Tilbury spring is in Essex, and Andree's is a chemical analysis.

[45] Perry (1698-1780) held medical degrees from Leyden and Cambridge, traveled in the Near East, 1739-42, and settled down to practice in London in 1742.

[46] Hillary (d. 1763), pupil of Boerhaave, was a systematic observer of prevailing diseases and wrote a substantial work on tropical medicine.

rapidly. March to November was the best season for taking the water, and before breakfast the best time of day. The quantity varied with the patient. It was inwardly beneficial for obstructive diseases and outwardly for scrofulous eruptions. In support of his contentions Hillary cited a number of cures.

Similar in character and appearing either at the same time or within a few years were pieces by Meighan (70), Baylies (71), Manning (73), and Randolph (72).[47] The latter's analysis of Bristol water was historical, medicinal, and bibliographical in approach. He described the spring and its early uses, referring to Venner, Jorden, and Johnson. He remarked the praise given it in bygone years and its record of beneficial effects on stone, diabetes, consumption, uterine troubles, and scurvy. His own contemporaries, Keir and Shebbere, had analyzed it. Its virtues were apparent in internal and external uses but the latter had largely been disregarded in recent years. Randolph himself had analyzed both the waters and the diseases relieved by them. He found the former sulphureous, aerated, pure, mild, and having a temperature of 76. The chief ailments benefited were fevers and uterine difficulties.

Meanwhile some new literary elements had begun to extend the popularity of watering-places and at the same time to reflect their increased and more diversified patronage. First of all, in the second third of the century one may note the rapid development of "guide" literature to various baths, which was to multiply as the century wore on (63).[48] Although it seldom contained much of medical import, this sort of publication at least reflected the strong belief in balneotherapy, and some of it warrants attention. Secondly and contemporaneously, the appearance of new English periodicals definitely swelled the contributions to balneology.[49] Even

[47] Baylies (1724-87) practiced as an apothecary; after losing his Bath practice he went first to London and later to Prussia. Meighan, Manning, and Randolph are unknown to me.

[48] John Wood was an architect at Bath. Christopher Anstey's *New Bath Guide: or, Memoirs of the B--r--d family. In a series of poetical Epistles* should not be confused with *The New Bath Guide, or Useful Pocket Companion* (1762-1803; 16th ed., 1803). George Carey's *Balnea* will be treated below.

[49] Because of its fugitive character this material does not lend itself either to easy classification or to ready incorporation within the general scheme here followed. For convenience, however, an attempt has been made to group related items together irrespective of publication date. Not infrequently pieces were printed long after their original composition and without adequate or even any acknowledgement of their source. Editors seem often to have followed the practice of including such items as fillers, and the identical suggestion may appear in two or more magazines years apart. But whatever their nature and circumstance of publication, the value of these items as straws in the

though many of the items published in them were but abstracts of larger works or of papers in the *Philosophical Transactions*, this does not diminish their genuine importance. There were many original pieces and in any case the abstracts reached readers who otherwise would have missed some if not all the original publications from which the abstracts were made. In general the periodical items are brief and often without titles, but their value in exhibiting balneal interest is considerable, especially when it is rememberd that the expansion of periodical publications reduced the need for the individual pamphlet.

Although many contributions to periodicals were fairly lengthy and substantial accounts of balneology in general or of particular "waters," others were no more than bits of advice or miscellaneous news. Such for example was "A Letter from the late Sir John Floyer to Mr. King of Bungay, Suffolk, in Recommendation of the Cold Bath," (1734), of which the content is obvious from the title and from the author's well known predilection.[50] Other praise for the cold bath without noticeable change of attitude appeared in some remarks in the *Lady's Magazine* in 1787, the *Hibernian Magazine* in 1791, and again in the *Gentleman's Magazine* for 1791. Cold baths, it was argued, benefited invalids and reduced the likelihood of taking cold. Strenuous rubbing after bathing was strongly urged; and one writer went so far as to recommend both the addition of sea salt to the regular bath for children and the impregnation of towels with it (199). Other casual bits of advice included a reminder in the *London Magazine* for 1747 that bathing was often imperfectly, even injuriously, practiced and in consequence lost its salutary effects. As if to bear this warning out the *Scots Magazine* a little later published an account of a man who found that the "waters," taken inwardly or externally, aggravated his stomach ailment; and still later in 1766 the ill effects of sea water, drunk by a young woman, on tumor and inflammation were emphasized. Yet admittedly, as other evidence revealed, bathing benefited ulcers and rheumatism (202).

Not less interesting than these varied hints were the occasional advertisements (200). In 1735 the *Gentleman's* advertised "a fresh parcel of Pyrmont water, which was not filled till the proper Season, and when the Water was in its full Strength and Perfection," and also a quantity of "fresh German Spaw Water" as well as Scarborough, Bath, and Bristol

wind as well as for themselves warrants no neglect or scorn: they bespeak a most extensive reading public.

[50] This "Mr. King" was the John King already noted, who had addressed a letter to Floyer, and who subscribed to Floyer's theories.

waters.[51] A longer notice, in different vein, appeared in the *London Magazine* for 1739:

The Tilbury Alterative Water, Received and Approved by most of the eminent Physicians.

Cureth the Looseness, the Bloody Flux, the Piles, Bleeding at the Nose, and all other Kinds of Bleedings, and Weaknesses incident to both Sexes: Also the Scurvy and Cutaneous Eruptions, and Redness and Flushings of the Face. It strengthens the Nerves and Stomach; it prevents Miscarriages, and invigorates the Body; It corrects Acids and Crudities in the Stomach and Bowels, whether from Irregularities or Debility of Constitution; and helps habitual Colicks and Heartburn. It likewise relieves the Rheumatism, the Gravel and Stone; and drank with warm Milk is very beneficial in Consumptive Cases. The Water bears carrying to the Indies without Alteration, and keeps good a great while,—it is so soft and pleasant to drink, that it seems to the Palate like a Mixture of Milk and Water. It has all the Virtues of the Bristol Water, and excels it in strength by many Degrees. To avoid imposition, observe, that if you give the water a short and quick boiling, it turns white like whey; and upon pouring a small quantity of white wine into it, it becomes clear again; which if sweetened to your Palate, makes as pleasant a Drink as Sack-whey, and is as beneficial in any Cold or Cough. Sold at Mrs. Kellaway's, near the Pay-Office, Broad Street; and at Dr. Day's, Shoe-maker, near the Savoy, Strand, and nowhere else, at 6d. per Quart. Printed Directions are given away with the Water how to use it.

Less consciously an advertisement was the report in the same journal for 1736 that the waters of "Lough-Leighs in the County of Cavan in Ireland perform such wonderful cures, for the Scurvy, Itch, Cancers, Scald-Heads, Scabs, Ulcers, and Venereal Disorders, that People from all Parts of the Kingdom were flocking thither."[52]

[51] An earlier advertisement not unrelated to the interest here is to be found in Defoe's *Review*, III (1706), 92, recommending "King Charles II, his Lyme Water, rightly prepar'd for all gentlemen who drink wine, being a dryer up of superfluous humors, a sweetner of the blood, a restorer of nature, and procurer of lost appetite. It cures the dropsie, asthma, ptysick, consumption, cold, palsy, stone in the kidneys and bladder. It is infused with many choise roots, woods and seeds, fermented with blue currants, rectifi'd with mace, flavored with violets, and enrich'd with the finest truest pearl, and sold only at the Rainbow Coffee-house by Fleet-bridge, at 5s. the quart bottle; directions will be delivered with the bottles."

[52] Although I have made no effort to include here references to tar water it is probably worth a note. In 1744, Bishop George Berkeley published *Siris: A Chain of Philosophical reflections and Inquiries Concerning the Virtues of Tar Water* in which he explained that his specific would cure such diverse ailments as gout, smallpox, gangrene, scurvy, and fevers. The periodicals printed recommendations of tar water by the dozens, and upwards of a hundred diseases were pronounced curable by this miraculous concoction which was equally effective for erysipelas in men, distemper in cattle, and "troubles" in women. For attention to Berkeley and his discovery, consult Burton Chance, "Bishop

Somewhat, but not much, more lyrical were infrequent outbursts of poetry (201).[53] In 1743 the *London Magazine* printed an "Ode on a Medicinal Well in Breconshire, call'd the Stinking Well, from the foetid Smell and Taste of its Waters; and grown very famous on account of their Efficacy in many Chronical Distempers and Scorbutick Cases." Both the original Latin and an English translation were given.

Fair Nayad, tenant of the mossy cell
All hail, thou guardian of the Cambrian Well!
Whose stream on nature's lap, that genial glows,
Impregnates with cleansing sulphur, flows.

With grateful heart I court thy liquid bowers,
Sprinkle the sacred wine, and strew the flowers.
Thy cordial draughts luxuriant health regain,
And rooted ails evade thy search in vain.

Not Asian Hermus' yellow waves can dare,
Tho' stretch'd o'er golden beds, with thine compare:
Nor needs't thou fear to trust impartial fame
O'er Baja's springs to raise thy greater name.

O never cease to yield thy healing springs,
Invite fair health to come on Zephyr's wings;
So may nor summer's heat, nor winter's rain
Imbibe thy current, or thy water stain

Forty years later another versifier declared "Nature the Best Physician."

In Bladud's old city, surrounded by hills,
Where the fount always heals, but the physic oft kills,
Lives a fam'd Jewish doctor (not one of the rabbies)
But a medical doctor, esteem'd by the tabbies.

Still later "a lady who has received great Benefit from drinking the Water" addressed some verses in the *Gentleman's* to a "Chalybeate Spring, Caversham Hill":

Coy Nymph of this salubrious fount,
Who many an age, unpriz'd,
Didst waste thine urn adown the mount
Unnotic'd or despis'd.

Of course, other works of the sort that had been appearing for two hundred years continued to be published; indeed the number seems to

Berkeley and his Use of Tar Water," *Annals of Medical History*, 3 ser., IV (1942), 453-67. The immense bulk of periodical literature on the subject still awaits its surveyor.

[53] See also *The Bath, Bristol, Tunbridge and Epsom Miscellany. Containing, poems, tales, songs, etc.* (1735, 1740).

have increased in the middle years of the eighteenth century. Dr. Diederick Wessel Linden was especially prolific during three decades, with his accounts both general and specific, descriptive as well as controversial (74).[54] The waters of Islington, Glastonbury, and Dunse came in for praise and analysis (75).[55] John Summers issued a somewhat generalized recommendation of warm bathing in paralytic disorders (76); and Glass ventured to supply an historical survey of bath treatments (79).[56] Rather more popular if not invariably more significant were pieces by William Oliver the second (77), Tobias Smollett (78), Richard Russel (80), and Rice Charlton (82).[57]

Oliver was particularly concerned with the value of bathing as a cure for the gout, and he felt that persons unfit to bathe suffered a great deal. Because improper bathing was dangerous men should not condemn a proper regimen. Bath water softened, relaxed, and dissolved obstructions, but the age, temperament, and manner of living of the patient should all be considered in planning his treatment. For instance, weakened people would find ten to fifteen minutes twice a week quite enough. Patients should take certain cleansing medicines and adhere to a moderate diet and regimen, both cooling and evacuating. From April to October was the ideal time to pursue the bath cure. In addition to this essay Oliver had importance at Bath because of his supposed domination of medical practice there, in consequence of which two physicians denounced his "physical confederacy" (87).

[54] I regret very much my inability to find anything about Linden; so prolific an author deserves something better than silence.

[55] Francis Home (1717-1813), who described the virtues of Dunse Spaw (and who may have owed his great age thereto), was a military surgeon of great eminence before he became professor of medicine at Edinburgh.

[56] Summers is unknown to me but T. Glass (1709-86), M. D. Leyden, was a physician at Exeter.

[57] William Oliver (1695-1764), no relation to William Oliver (1659-1716), M. D. Cambridge, was a prominent Bath physician for many years; he is also remembered as the inventor of the "Bath Oliver" biscuit, the recipe for which he bequeathed to his coachman who soon made a fortune. Richard Russel (1700-71) practiced first at Lewes, Sussex, and then at London. Rice Charlton (1710-89), M. D. Oxford, demonstrated on the evidence of nearly a thousand cases that part of the reputation of Bath waters in curing palsy was owing to abstinence from cider which had caused paralysis by lead poisoning. In favoring warm bathing for paralytic disorders he ran counter to the famous Dr. Richard Mead (1673-1754). Tobias Smollett (1721-71), novelist, physician, and historian, scarcely requires comment. He also praised the "waters," both of Bath and the sea, in his correspondence. See *The Letters of Tobias Smollett, M. D. Collected and edited by Edward S. Noyes* (Cambridge, 1926), 77, 87. In *Humphry Clinker* he incorporated the shrewdest of judgments, favorable and critical, on the value of the Bath waters, the character of the city and its inhabitants, and balneology in general.

In the same year that Oliver published his work, one of the most famous literary figures of the century, Tobias Smollett, M. D., issued *An Essay on the External Use of Water*. He stressed the diversity of opinion among physicians concerning the quality of hot waters. For him, pure water was the " most salutary beverage . . . best fitted to mix with all the animal juices," and an excellent aid to good spirits and longevity. He recalled that some authorities, notably Floyer and Baynard, had favored the external use of cold water, but he himself preferred warm bathing for the treatment of many disorders. In addition to his medicinal comments Smollett emphasized the need of reforming the administration of the baths of Bath. He deplored the promiscuous bathing, holiday bathing, the lack of guides, and called for proper fees, a convenient number of chairs, quiet, and set hours and days. Incidentally in his letters Smollett praised the benefits of Bath and also of sea bathing.

Varying somewhat from these pieces but bearing on the same general subject of balneotherapy was Russel's *Dissertation on the Use of Sea Water in the Diseases of the Glands*. The author praised sea water as promoting digestion and chylification. He knew no medicinal resolvent so powerful as sea water taken inwardly. It benefited sailors suffering from bilious colic; it drew forth humors from tumified glands; it was an excellent remedy when the belly was bound. However, some cautions must be observed in its use, and those of a hot constitution should never drink it. Furthermore, Russel strongly recommended sea bathing, the salt being a stimulant and efficacious cleanser of the skin glands. Used hot, it softened tumors. In proof of his claims he listed many cures, including rheumatism, rickets, palsy, leprosy, and colic, and declared that it had been " customary for those who have been bit by a mad dog, to go to be dipt in salt water; and if it be done before the patient is affected with the Dread of water, it generally succeeds."

Rather more technical than the three preceding writers was Rice Charlton who confined himself largely to technical analysis, although he did discuss at considerable length the effect of Bath waters on palsies. He noted that Bath waters had even been deemed chalybeate, and he went on to describe the heat and other qualities of the various baths. He did not hesitate to engage in controversial bouts with other commentators, and declared that it was a matter of dispute as to whether the waters were sulphureous. He himself believed some sulphur to be present, but it was not the common brimstone variety; rather, it was " an exceeding fine aromatic Balsam."

In the therapeutic tradition George Macaulay described the benefits of a warm bath in curing lockjaw (83), and Thomas Reynolds related his experiments with some chalybeate waters which had been discovered in Kent in 1754, an abstract of which appeared also in some of the magazines (84, 216).[58] According to him the water passed through gravel and had been segregated from other waters thereabout. It had been found to improve digestion and cure the gout. The water contained iron in solution and an alkaline salt. On the basis of his experiments and observations Reynolds gave directions for making an artificial chalybeate water with sal martis, rain water, and salt of tartar, and also how through a process of evaporation for distinguishing artificial from natural chalybeate.

In 1756 likewise Dr. John Wall published his observations on Malvern Waters, the same material appearing in the *Philosophical Transactions* and the periodicals as well (85, 184, 217).[59] Malvern Well had two springs, one a very light chalybeate, the other, Holy Well, which cured many obstinate diseases. Both were extraordinarily pure, and although the chalybeate had less iron than some similar springs it was so pure that the iron more readily mixed with the blood and juices of the body. Bristol hot well, for example, had twenty times as much earth; Tunbridge had three times more iron but six times more earth. Malvern waters also possessed various other minerals, including a slight impregnation of copper. They cured many ailments, notably ulcers and cancer, and were good both for bathing and drinking. Wall also commented on Pyrmont Waters.

The Royal Society showed no diminution of interest in these same years. James Mounsey, physician to the Czarina's army, described the character of the baths at Carlsbad (182). A few years after, Jeremiah Milles was greatly impressed with the curative record of these baths and discussed both the nature of the waters and their medicinal effects (185).[60] The versatile Stephen Hales and Swithin Adee analyzed the waters of Jessop's Well and through experiment and varied testimony concluded that this water and its crystalline salts had a strength superior to other wells.[61]

[58] Reynolds was a surgeon; Macaulay has eluded me.

[59] Wall (1708-76), a distinguished Worcester physician of wide interests, wrote on fevers, smallpox, cattle distemper, sore throat, and pediatrics. He reported the seemingly incurable case of an eight year boy with ulcers on his face, arms, and legs, who was cured by drinking and bathing in these waters; other difficult cures included a woman with an internal cancer and a man with elephantiasis.

[60] Mounsey died in 1788, aged 96; Milles (1714-84), antiquary and naturalist with wide interests.

[61] Hales (1677-1761), a most interesting and versatile man—curate, physiologist, and inventor. Adee I have not found.

Hales had examined several other purging waters and supplied a list of the " several quantities of sediment found in a pound avoirdupois " of various waters " evaporated away to driness in Florence flasks." Adee had prescribed Jessop's water for " obstinate scurvies " and as a purgative and had found it " very beneficial to mankind." This material also appeared in the magazines (183, 213). John Walker contributed an elaborate account of Moffatt Well, near Annandale, Scotland, which was likewise summarized in the *Gentleman's Magazine* (186, 219).[62] He listed its chemical constituents, notably a large proportion of iron and aluminous salt, outlined his technique of analysis, and compared this water with others. He concluded with the query: knowing the character of natural mineral waters, may we not prepare better artificial ones. Joseph Bruni described how the Piedmont baths cured paralysis, rheumatism, and skin ailments (189).

Of broader interest than such contributions were those of Scottish Robert Whytt whose ideas reached various readers through books, the *Philosophical Transactions*, and magazines (81, 187, 231).[63] Moreover, it should be remarked that, whether or not he was the direct stimulus (and he may well have been), for some twenty years after his entrance into the realm of balneal literature, Edinburgh was the scene of considerable publishing in this field. Whytt made many experiments to prove the virtues of lime water in the cure of the stone. Though thoroughly familiar with such natural mineral waters as Carlsbad, he seems to have been primarily concerned with producing an artificial water out of oyster or cockle shells, which cured the same ailments as many spa waters. The publicity which his ideas received illustrates how completely the conviction of the value of " waters " had fastened itself on people's minds, for the periodicals especially played up the potentialities of artificial mineral waters.

Reference to the attention aroused by Whytt serves to recall that natural " waters " still obtained much space in the magazines. The grandmother of all baths, Bath itself, was extensively publicized in the *Universal Magazine* for 1747 in " Observations " that were clearly lifted from some standard treatise in order to give readers and possible visitors the opportunity to prepare for the Bath season just beginning. The author related the antiquity of the baths, the salubrity of the climate, and the diet, medicines, and general regimen of bathing. The names of the physicians, surgeons, and

[62] Walker (1731-1803), professor of natural history at Edinburgh.

[63] Whytt (1714-66), professor of medicine at Edinburgh and author of various medical works, not the least of which was an important piece on neurology.

apothecaries of Bath were also appended. Some ten years later the same magazine carried similar material, as did the *Gentleman's* in 1762. In the latter periodical one writer commented on the remarkable appearance of Bath waters. Cakes, blackish in color floating on the surface and composed of mucilagium ferri, a concomitant of iron-stone, iron-ore, and iron-earth, caused a natural crystallization of salts in the bath. These gave the waters their great medical efficacy, especially in external application. Another writer explained that these waters neither purged nor vomited but were a salutary beverage against many disorders. They contained no sulphur and but a small quantity of arsenic. Although this latter in its simple nature was poisonous, when overpowered with sulphur or brimstone it became a safe medicine (208).

Perhaps not to be entirely separated from the more purely medicinal notices were those touching social life (206). The *Universal* in 1766 had several references to the season. Similarly in the next decade, the *Oxford, Lady's*, and *Town and Country* periodicals supplied their readers with accounts of manners and adventures, amorous and otherwise, at Bath. The *London Magazine*, in announcing the departure of a famous physician for London and thence to America, noted that he had cured many people, unsuccessfully treated by other doctors, by Bath waters; the cases included both paralytic and scorbutic disorders. At the end of the century, according to the *Monthly Magazine*, the population of Bath was 30,000.

Some accounts of Tunbridge also came to the public's attention (209). The character and benefits of the waters, their location, the proper season, regimen, and cures were explained and the great virtues stressed. The first knowledge of their medicinal value occurred in 1606 when the owner of the estate on a walk through his property quite accidentally discovered their extraordinary quality. The excellent waters of Matlock and Buxton were even more highly praised (210). They were compared with other waters and writers lamented that they had been much neglected. Buxton water, sparkling, abounded with mineral spirit and various chemicals and was not to be taken in excess; it purged lightly. Matlock water resembled Bristol well, being especially famed for its hot baths.

Less well known was Dunse spa which had only recently become at all famous. It was excellent for scurvies, itches, inflammations, gravel and rheumatism, and benefited nervous and hysteric disorders. It abounded in steel and sulphur and also contained salt, working chiefly by urine, less often by purges (211). The waters of Glastonbury were found efficacious

for the cure of many diseases—hysteria, gout, asthma, " dim eyes," rheumatism, ulcer, palsy, sore leg, deafness, and sciatica. The waters must be used with great caution because, being so strong in sulphur, they were so violent as to cause injury when drunk at the source. An apprentice, cured of an ailment after drinking them two Sunday mornings, died the following day. When the virtues of these waters were told to an old lady, she replied that she did not wonder for she could remember when the " humor of the people ran as high for cow piss for the cure of the same distemper . . . thousands would flock in a morning to St. James's park to follow the cows, and happy were they that could catch their waters while they were warm, which they drank as a great cordial." The editor insisted that this anecdote was a fact and inserted " to shew the capriciousness of popular taste." The waters themselves aroused a considerable controversy, many cures being attributed to them on the one hand, whereas on the other, analyses by doctors proved them to be ordinary spring waters with no medicinal properties (212).

Among other springs to receive praise for their excellent medical value were some Copper Springs in Ireland (214) and Hartfell Spa in Scotland (215). This latter, the subject of extensive literary attention, was lauded for both internal and external use. It cured eruptions and stomach, bowel, and bladder disorders. The water could be drunk at all seasons though warm weather was best, because exercise and perspiration were then easiest. The waters required no strict diet or regimen, but the *primae viae* should be cleansed and the waters should be drunk fasting and in moderation. The amount varied with the age and condition of the patient, and the length of treatment would depend on the individual case. The water had the added virtue of keeping well when bottled. Two English wells receiving brief mention in the early 1760's were Burton Lazors (220) and Bristol (221). The first, relatively unknown, was a spring of fine clear water near Melton Mowbray, Leicestershire. Since the reign of Henry I it had had the reputation of being particularly good in curing leprosy and other skin diseases, and several recent cures were listed. The notice on Bristol well added nothing to what was already known.

Although the bulk of attention in the periodicals was directed towards English waters, continental baths now and again came in for comment. Of these none exceeded Carlsbad in importance, popularity, and interest (218). Among their other virtues, the capacity of these waters to cure stone in the bladder—wherein they even excelled lime water—was highly extolled. This was established by numerous experiments, and it was

suggested that Carlsbad water had the power to dissolve the "tophaceous crust which frequently covers the teeth." Generally two hundred persons drank the waters in the season from May to August. Their regimen was as follows:

> they begin with a purge; and assist its operation with ten or twelve chocolate-cups of the water, taken within five minutes of each other. The day following they take the waters in the same quantity, and at the same intervals, keeping themselves all the time in a warm room; which, with the warmth of the waters, occasions a most plentiful perspiration. This repeated for seven or eight days, increasing daily two or three cups of the water, till they come to drink 25 or 30 cups a day. The operation continues from eight of the clock in the morning till noon. Some bleed once in the middle of the course, others not at all. After they have finished this course of drinking, they bathe two days successively, continuing in the bath half an hour, or longer, as their strength permits them, or their case requires. This is the whole course; which is repeated two or three times, or oftener, as they find necessary. The whole is concluded with a gentle purge, though the waters themselves are of a laxative nature.

The suggestion that Carlsbad waters surpassed lime water in curing the stone excited Whytt to protest. After giving an account of his own experiments he affirmed his disinclination to compare definitely the value of Carlsbad and lime water; though the first were more agreeable to the taste and might be drunk in larger quantities, lime water had the undoubted advantage of being equally good in all places and seasons (231).[64]

Somewhat later and more generally an article in the *Scots Magazine* compared English with various continental baths. Another in the *Universal* remarked the number of baths in Turkey, and a third in the same magazine described at length the Ischia Baths in Italy, pointing out that their medical value was uncertain. The *Lady's Magazine* also stressed the prodigious number of baths, public and private, at Constantinople. Finally, in this connection, the use of hot baths all over Egypt aroused comment, and a writer described the manner of bathing with its beneficial results (204).

Although far less pertinent to the main interest here, magazines following in the path of some earlier books occasionally emphasized the universal virtues of common water (203). The purity of water contributed greatly to health, although by insensible degrees the human body became infected with "minute quantities of insallubrious matters." Therefore it was

[64] There were many references to lime water in addition to those cited; see for example: *Scots Magazine*, VI (1744), 140-141; XIV (1752), 395, 486, 625-6; XVII (1755), 175-6; XX (1758), 186-89; *Gentleman's Magazine*, XXIV (1754), 205-7.

necessary to understand how the contents of ordinary water might be determined. As pure water had great medicinal value, impure had great potentiality for disease, especially when one considered the overwhelming dependence of the human body on water in its various forms. The author listed waters in order of their purity as follows: snow, rainwater, water of limpid rivers, spring water, and ordinary river water. In conclusion the editors cautioned the "fair sex" against "spring or hard waters, either for their drinking, or for their tea."

More in keeping with the main outlines of balneology was the concern with sea water and bathing (229). Inspired by Russel's treatise, a writer in 1752 pointed out the potential value of sea water for health. Another, ten years later, recommended sea water as a purge and praised sea bathing; on the other hand, cautions must be observed for sea water could not be prescribed indiscriminately. Useful hints on sea bathing were published. More than this, a good deal of attention was given at the end of the 18th and beginning of the 19th centuries to seaside resorts and infirmaries.

The Sea Bathing Infirmary at West-brook originated from the desire to extend the benefits of sea bathing to the poor. Opened for patients in 1796, its director and other members of the faculty supplied medical advice and medicines gratis. Not long after a similar infirmary was opened at Margate. On the first aniversary of its founding twenty medical and other gentlemen examined the patients, expressed satisfaction with its economy and management, and commented on the improved health of the inmates. Several surgeons present expressed the belief that treatment at the infirmary had actually prevented amputations in a few cases. Somewhat later, the infirmary again came in for high praise, and the cases of a blind boy who regained his sight and of other persons who were enabled to throw away their crutches were cited.

Such miraculous achievements, however, did not prevent one writer from issuing salutary advice on sea bathing. Although beneficial in many cases, cold bathing was often used indiscriminately. The time of the day was important: one should not bathe immediately upon arising. One should bathe leisurely. Those with tender lungs or irritable bowels should wear thin flannel next to the skin and gauze worsted stockings. Autumn was the best bathing season for such people, and they should wait a considerable time after breakfast. Walking a mile or two previous to bathing was good, and a brisk rubbing of the body just before immersion was advised. Throughout subsequent years the Margate and Brighton infirmaries gained great applause as centers of cure for scrofulous and ulcerous complaints and also for pulmonary consumption.

Emphasis on the varied content of periodicals should not of course convey the impression that the publication of individual books fell off in the fifties and after. Indeed the opposite was the case, for the tide of balneal literature flows ever higher in the second half of the century. Two of the most industrious and contentious writers of the fifties and sixties were Charles Lucas (86) and John Rutty (88, 188).[65] The first dealt with the whole subject generally, analyzed some specific waters, and engaged in controversies with his contemporaries, notably with Rutty. This writer published a quarto of over seven hundred pages on various mineral waters, and, like Lucas, wrote smaller works on specific waters and defended his views against critics. In his huge *Methodical Synopsis* he paid high tribute to such earlier writers as Boyle, Short, and Shaw, and displayed considerable knowledge of the contributions of lesser known authors. He also in the same book analyzed many, many waters, illustrating their character and effect on various substances by exhaustive tables; he described the virtues of these waters in detail, and he included much historical information about their discovery and usage. Moreover, in addition to this comprehensive treatise, he presented data to the Royal Society concerning two spas, Almwch and Hartfell, of which the former was so strong that its waters could not be drunk; it cured the itch in man and the mange in horses by bathing. All told, Lucas and Rutty were exceeded by none in their encyclopaedic range of balneal interest and contribution.

Another writer of interest in these years was Alexander Sutherland whose concern with balneology was interwoven with a campaign to revive ancient medical doctrines, as a consequence of which his ideas received attention in the periodicals (89, 234).[66] He examined baths, ancient and modern, the natural history and chemical constituents of Bath and Bristol waters, and the diseases that fell respectively under the beneficient powers of those waters. Bath waters were pernicious in disorders arising from an inflammatory lentor, salutory in those resulting from a pituitous lentor. They seldom failed in cases of "decayed" stomachs and bilious colic, scorbutic atrophies, and most diseases of the liver and spleen. Bristol

[65] Charles Lucas (1713-71) was a lively controversialist in medicine, attacking among other things abuses in drugs, and in the realm of political economy; he wrote extensively. John Rutty (1698-1775), of Quaker origins and very pious, was an M. D. from Leyden; he was altogether public-spirited and wrote at length on drugs and diet.

[66] Sutherland practiced at Bath and Bristol. Another work of interest in this period came from the prolific writer on surgery and the plague, Dale Ingram (1710-93), *An Inquiry into the Origin and Nature of Magnesis Alba, and the Properties of Epsom Waters; demonstrating that Magnesia made with those Waters exceeds all others* (1767/68).

waters were excellent in coughs, catarrhs, hectic fevers, asthma, diabetes, gravel, stone, consumptions, and scorbutic eruptions.

Apparently Sutherland was concerned over the attention which his ideas aroused, for he wrote an interesting letter to the Earl of Northumberland on the subject of a second edition. Here he noticed,

> When authors deviate from their original plans, the public in general has a right to be satisfied. . . . In my first edition, my subjects were so complicated and interwoven, that I found it not so easy to pursue them to my satisfaction. Some parts suited the taste of some readers; others of others; few care to pay for what does not particularly relate to their ailments. Laboured disquisitions are not the taste of the times; with more zeal than prudence, I might have inveighed against prevailing errors. . . . Disappointed in materials, I, for the present, pass over the first doctrine, that of Baths antient and modern. The second is my publication. An Attempt to Ascertain, and extend, the Virtues of Bath and Bristol Waters, dedicated to your Lordship. The third treats of Medical Use of Sea-Air and Exercise.

Meanwhile J. M. Stevens analyzed Bath waters in a work dedicated to a steady patron of the place, William Pitt (90), de Limbourg discoursed on various types of baths (91), an anonymous writer traced the effects of bathing, hot and cold (92), and John Awsiter concentrated on sea bathing (93).[67] Mineral waters received attention from an unknown writer (94) and at greater length from Donald Monro (97). The vapor bath, coming more and more into favor, was described by Symons (95) and Denman (96). Mastini praised some Italian waters (98), and William Falconer took rank as the most prolific author in the latter part of the century by numerous works on all phases of balneology (99). Rotherham by contrast limited himself to a discussion of water (100), but Dominiceti rambled at length among baths, artificial and natural (101). Somewhat more precisely, Armstrong (102, 107) and Cochrane (103) treated limited aspects of the subject. Barry disobeyed an ancient injunction against mixing wine and water (104), and Daniel Lysons mixed balneology with various other therapeutic treatments (105).[68] Finally,

[67] Stevens was a doctor and fellow of the Royal Academy of Sciences; Awsiter, apothecary to the Greenwich Hospital, wrote *An Account of the Effects of Opium as a Poison* (1763). De Limbourg is unknown to me. The astronomer, John Bevis (1693-1771), published in 1760 a work both general and particular under the title, *An Experimental Inquiry concerning the Qualities and Medicinal Virtues of the Mineral Waters, lately discovered at Bagnippe Wells, near London; with Directions for drinking them and some Account of their Success in Obstinate Cases.*

[68] Monro (1727-1802), an army physician of varied attainments; Denman (1733-1815), greatly distinguished as an obstetrician; Falconer (1744-1824), a man of extensive literary output and good abilities; Rotherham (1750?-1804), professor of natural history at St. Andrews; Armstrong (1709-79), poet, physician, and essayist, author of the poetical

it must be recalled that no commentator on Bath waters was more widely known than Dr. James Graham, the owner of the Temple of Health and the Hymeneal Temple, of which the chiefest ornament was the wonder-working, offspring-producing Celestial Bed (106).[69]

To leap from this environment to the meetings of the Royal Society taxes the skill, but it must be remembered that the keenest scientist as well as the most fantastic charlatan saw in the waters a sure guide to health. William Brownrigg presented a long technical paper to the Society in 1741 but it was not printed until 1765 when he contributed another report on a related topic. Some years later he communicated additional information of the same sort (190). In 1766 Daniel Layard and Michael Morris, carrying on independent investigations, arrived at substantially the same conclusions concerning the chemical constituents of Somersham water (191). Howard (192) and Canton (193) were similarly technical in their analysis of Bath and Bristol waters, as were Monro (194) and Percival (195) on the objects of their examination. Dobson (196) largely stressed geological phenomena, and Schmeisser (198) was almost exclusively chemical. The same was true of Richard Watson, Bishop of Llandaff, but his ideas got wider circulation through the *European* and *Universal magazines* (197, 222).[70] It is quite clear that during the last third of the century a definite change has overtaken the Royal Society in its concern with balneology. General description has given way to technical

Art of Preserving Health (1744), was an army physician and wrote much on medicine; Barry (1696-1776), distinguished Irish physician, professor at Dublin, physician to the king's forces in Ireland, the first British physician to discuss wines scientifically; Lysons (1727-1800) practiced at Bath where he was physician to the General Hospital. Symons, Mastini, Dominiceti, and Cochrane have eluded me. See also in this period, Dr. Thomas Houlston, *An Essay on the Liverpool Spa Water* (1775). Houlston, a Liverpool physician, wrote on poisons and hydrophobia.

[69] Graham (1745-94) studied under Monro, Whytt, and others at Edinburgh. He claimed that unlike "quack empirics" he never promised a cure and declared that as many persons came to Bath well and died or left in bad health as came ill and were cured. He denounced the "constant racket of amusements and dissipation," crowds, overheated rooms, poisoned air, tea, coffee, hot water, indigestible bread "drenched with oiled butter in the morning, with poisonous wine at dinner," and the tight lacing of ladies. He praised music as of inestimable value in facilitating cures.

[70] Brownrigg (1711-1800), M. D. Leyden, physician and chemist, especially interested in mine damp; Layard (1721-1802) wrote on such diverse problems as the cattle distemper and hydrophobia; John Howard (1726-90), the philanthropist; John Canton (1718-72), an ingenious natural philosopher; Thomas Percival (1740-1804), a very social minded physician, distinguished alike in medical ethics and fevers; Watson (1737-1816), a man of wide and incisive scientific attainments. I have no data on Morris, Dobson, and Schmeisser.

analysis and the enthusiastic amateur has surrendered to the trained specialist. Balneology has become a science.

That of course is not true as regards popular interest. The periodicals continued to print as earlier considerable sundry advice and descriptive matter (205). Certain waters, taken in the summer, strengthened the digestion; others, in a particular neighborhood, benefited the gout; a vapor bath was a cure-all. The value of baths had been recognized since ancient times. The possibility of manufacturing Pyrmont water was discussed, and its virtues in the natural state were praised (232). One article lamented the ill effects of excessive rainfall on the water places (207). Another analyzed *Domiphobia*, dread of home, to be relieved only by a jaunt to a watering place. The ill effects of spas upon those needing rest were stressed and sea bathing was offered instead. Watering places had bad accommodations and brought no improvement in health (230).

Such criticism naturally did not halt "plugs" for the various spas. A writer in the *Scots Magazine* for 1773 compared Epsom and Harrogate waters as to their color, taste, smell, and minerals but did not draw any medical conclusions. Harrogate, as has already been noticed, received a thorough analysis in 1786 (222). The character of the waters and social conditions at Cheltenham were surveyed in 1786, and in 1794 another article praised the waters for their purgative and restorative qualities. Ten years later the *Gentleman's* abstracted Thomas Jameson's book on the same subject (223, 133). He believed the chief virtues of the spring to consist in the cure of bilious disorders. Yet "the more valuable any remedy proves, the more liable it is to be abused. This is most obvious with respect to sea-bathing, calomel and Cheltenham Waters, neither of which can be used imprudently without serious consequences." Purging waters were often used indiscriminately and a physician's advice was essential for satisfactory results. Cheltenham waters should be taken in small doses so "that the stomach loaded with bile may be able to retain them."

The *Lady's Magazine* had high praise for Scarborough and Knaresborough waters, the latter being especially helpful for fluxes (224). The *Scots Magazine* abstracted J. Taylor's *Medical Treatise on the Virtues of St. Bernard's Well; Illustrated with Select Cases.* These waters, though not to be used indiscriminately, were a great aid to digestion; summer was the best season for taking them (225). The *Hibernian* printed a lengthy account of Lucan Spa, discovered in 1758. The waters were sulphureous, soft, and light, and lent themselves to drinking and bathing. They were

excellent for eruptions, rheumatism, indigestion, nervousness. Taken inwardly, the water operated mainly by urine but partly by perspiration. It affected different constitutions quite differently (226). St. Anthony's mineral well in Gloucestershire received attention in the *Universal* (227). The final magazine account in this period to be included here was an interesting description of the neutral saline waters of Hempstead by Thomas Goodwin (228). He made chemical analyses of their component parts, and observations both on their medicinal application and effects in certain diseases and on the different modes of bathing as auxiliary to drinking the mineral waters. He pointed out the virtues of the well, stressing the atmosphere, effects of respiration, action of winds, and the like. He supposed contagion to depend on an acid principle diffused through the air, which might be most efficaciously corrected by alkaline vapors, a principal ingredient being sulphate of magnesia to which salt the Hempstead water owed its peculiar quality.

During the last quarter of the eighteenth century "water" literature poured from the presses. Whether or not the American war and, later on, the French Revolution were responsible for this can only be conjectured, but reason would seem to substantiate the strong probability. People could not travel so freely on the continent; they perhaps also felt the strains and stresses even when wars were not "total"; and they had money to spend. The quality of the literature generally ranked higher than in the past, and the products of the mere enthusiast were fewer.

One of the most substantial yet popular authors was Hugh Smith (108).[71] He emphasized that the medicinal use of mineral waters was ancient and axiomatic but often abused, for the folly of man perverted the wisdom of God. Improper use brought waters into disrepute. People weakened by constant bathing fell easy victims to fever; they could also drink too much: a pint of Tunbridge water, for instance, contained about four grains of steel which was too much for any but the strongest constitutions. Patients needed a physician's direction, yet they often thought themselves competent to be their own doctors; in addition to suffering from medical quacks, people often quacked themselves. A mild evacuation was a necessary preface to drinking the waters which in summer should be taken fasting and early in the day. No medicine ought to be given before noon and then should follow food. The patient must omit tea. In the winter the waters might be taken between breakfast and dinner. People

[71] Smith (1736?-89), M. D. Leyden, author of *The Family Physician* (1760 *et al.*) and of *Letters to Married Women upon the Management of Infants.*

should not imbibe so large a dose as to promote quick discharge of urine or a purging stool or dizziness. Weak persons might well begin with a quarter of a pint. A walk between drinks was advisable. The water should be drunk in its natural state; heated, it lost its efficacy.

Smith believed the native chalybeate waters superior to the German spa especially when the latter were imported into England. They were free from cathartic salts and were salutary in such chronic complaints as nervousness, hysteria, glandular troubles, asthma, dropsy, fever, scurvy, biliousness, gout, and indeterminate nervous disorders which, following want of proper air and exercise, irregular hours, intemperance, and uncontrolled passions, produced a sort of wandering gout. The waters were also good for "hangovers" by promoting the insensible perspiration that Smith regarded so highly. Perspiration equalled any other evacuation in importance; a man perspired as much in one day as he evacuated by stool in five, and by insensible perspiration he lost three pounds a night.

More verbose, repetitious, and non-professional was the work of Philip Thicknesse who, however, performed a real service in referring to many treatises on bath waters and also summarizing various controversies on the subject (109).[72] In the foreword to his chief book Thicknesse recalled that Guidott thought Bath waters sulphureous, but that Mayow did not. William Oliver the first had agreed with Guidott, but Lucas had proved in the presence of Chesterfield that the waters derived their virtues from "a subtil acid, and a small quantity of iron." A chemist, said Thicknesse, ought to settle the matter once and for all. He himself agreed with Lucas, and he went on to remark that competent men had generally supported Lucas, even though he had suffered from persecution. In particular, Thicknesse defended Lucas's analysis of the waters against Charlton's.

The body of the work treated Bath waters in general, the need for regulating apothecaries, for getting a prescription from physicians, and for surgeons, the time of bathing, the diseases curable, historical anecdotes, and a miscellany of other items. The best months for bathing were April, May, June, August, September, and October. The author praised the waters as a cure for gall stones and spoke with authority, for he claimed to have been a regular "quarry." In some remarks on Oliver's essay on bathing and the gout, he maintained that people were often injured by indiscriminate and precipitate bathing and that they should first consult an able physician familiar alike with the waters and the patient. He related

[72] Thicknesse, the eccentric son of a more eccentric and very contentious father, circulated about Bath and London in the later 18th century; he was not a physician.

the antiquity of the baths, recalling that one hundred and thirty years before, Bath had been " the most filthy and offensive town in England " and that mixed naked bathing had been common. This recollection prompted some adverse comment on the promiscuous bathing of the sexes: " The man who can look on a fair woman in loose attire, whose beauty is heightened by the glowing warmth of the bath, with an eye of indifference must be one of the male sex I fortunately have never yet met with." Promiscuous bathing marked " *the approaching dissolution of kingdoms.*"

In a chapter on long life and health he noted that Frenchmen kept young by associating with young people, especially girls, and he recalled that " Dr. Cheney and many other ingenious men had wrote on this important subject, but all of them have laid down such rigid rules of abstemiousness, that few men have resolution enough to pursue the means." Men could not expect long life by drinking Bath waters, and then downing " hot spongy rolls, rendered high by burnt butter." He also had something to say in behalf of laudanum, " the pillar of physic," on wine and drinking to excess (he vastly preferred a drinking to a sober man), and on music—health was to the body what tuning was to the harp, and ancient poets showed their wisdom in attributing music and medicine to Apollo. In conclusion Thicknesse commented on the cure of dropsy and the need for its victims to adhere to a moist diet, and wound up with sundry remarks on the temperature of the baths, the hotels, theatre, bookshop, school, and other cultural facilities of the city of Bath.

Much more learned, comprehensive, and systematic was Dr. John Elliot's account of the principal mineral waters of Great Britain, Ireland, and the continent (110).[78] As a preface he included the tract by Joseph Priestley, " Of the Impregnation of Water with Fixed Air." Priestley thought to improve the navy's distilled water by impregnating it so as to prevent or cure scurvy. Sir George Savile, an active member of Parliament, brought this to the attention of Lord Sandwich, the head of the navy, who in turn referred it to a committee of the College of Physicians which reported favorably back to the Admiralty. The experiment showed that limestone and similar substances contained fixed air and that this mixed readily with water. Elliot believed that sulphur as well as limestone might be added, thus producing sulphureous mineral water as well as acidulous water.

Elliot in his list classified waters as chalybeate, chalybeate purging, and sulphureous, saline, vitriolic, and so forth. Chalybeate, the most useful

[78] Elliot (d. 1786) was a physician.

and beneficial, was very plentiful; it contained iron and strengthened and quickened all those who drank it. People should start with small doses, and the water might be warmed. All told the author listed some 230 "waters" of which thirty-six were foreign. The British waters were located in England, Wales, Ireland, and Scotland, the foreign waters in Germany, France, Italy, and Switzerland. In addition, he praised sea water which had excellent uses though not for fever, heat, or inflammation; it was particularly valuable for external use and for purging gross humors.

A sampling of the waters reveal some interesting judgments. Acton, good in May, June, and July, was bitterish; its purging made the fundament sore. Alford was purging, cooling, good for scurvy and jaundice, promoted urine and perspiration, was stimulating and good for nervous disorders; rather strong, it could be used both externally and internally. Bristol was mild, pleasant, good for consumptions, colics, uterine disturbances, immoderate menses, and dysentery; in external use, it benefited the eyes and healed ulcers. Buxton waters greatly resembled those of Bristol. Cheltenham waters aided scorbutic complaints. Dulwich well purged and cured stomach and nervous ailments. Pyrmont water (Westphalia) had a good taste, was somewhat sulphureous, caused urine, was gently sudorific, and relieved indigestion, scurvy, gout, "female troubles," and a rundown condition. Of Road water Elliot remarked that it did not bear carriage. Scarborough was popular and its waters abounded in fixed air. Tunbridge was light, saline, and mineral. With Elliot's book, then, no one need remain in ignorance of the various waters and what ailments each was most likely to cure or at least relieve.

Many other authors concerned themselves in the 1780's with the baths and their various applications. Robert Willan scrutinized in a capable manner some waters at Croft (111), but several of his contemporaries seemed more interested in specific aspects of treatment. Playfair suggested a method of constructing a vapor bath (112); Wright considered, as Macaulay had some years before, the efficacy of cold bathing in the cure of lockjaw (113); Corp concentrated on the value of Bath waters in the cure of jaundice (114). Adair and Freeman were concerned with the proper regimen for Bath patrons (116), and an anonymous author narrated several case histories in the treatment of paralytic disorders at Bath (119). On the other hand, Cheltenham (117) and Connel Spa (118) came in for descriptive analysis.[74]

[74] Robert Willan (1757-1812), M. D. Edinburgh, dermatologist; William Wright

Much more widely circulated than any of these was the work of William Buchan whose ideas gained considerable space in the magazines (115, 237).[75] His contribution, published separately and also in various editions of his extraordinarily popular *Domestic Medicine*, was inspired by the conviction that many people were losing their lives or ruining their health by cold bathing and the imprudent use of mineral waters. Many chemical books on the waters had appeared, but "one page of practical observations" was worth "a whole volume of chemical analysis." He found especially that cold bathing caused palsies and apoplexies and aggravated fevers. Cold bathing, it was true, had its virtues for urbanites and sedentary people by stimulating circulation but it augmented lympathic obstructions. Too precipitate plunging created the danger of bursting a blood vessel. Preparation by diet, purging, and the like was always needed. Cold baths were no doubt good for nervous persons which included many males and nearly all the female population of cities. They were also beneficial for children and were in this best before dinner and performed head-first. Mineral waters, Buchan dogmatically maintained, occasioned more diseases than they cured, largely because they were taken to excess. Purges weakened and too great consumption was an egregious error. Many people had succumbed to the fallacy that the waters having cured one disease would cure all.

The contentions of Buchan inspired a response from Dr. Richard Kentish who complained that Floyer had merely compiled ancient opinions and that Buchan was erroneous (120).[76] He found the antiquity of cold bathing "established beyond controversy." Pythagoras had carried it from Egypt to Greece; Hippocrates had stoutly advocated it. Even though medicine was a branch of physics, founded on philosophy, practitioners had attempted to make a mystery of it, employing "hard words, unintelligible jargon." Patients instead of being bled and purged ought to

(1735-1819), naval surgeon and botanist, a shrewd observer; James M. Adair (1728-1802) was charged by the elder Thicknesse with having had a disreputable career in the West Indies, where he had practiced medicine and studied the yellow fever, and with having added "Adair," the name of an obscure but respectable practitioner, to his own name of Makittrick. Playfair, Corp, Freeman, Barker, and Ferrar I do not know. To the works of these authors should be added that by James Johnstone (1730?-1802), a careful student of fevers, *Some Account of the Welton Water near Tewkesbury; with Thoughts on the Use and Diseases of the Lympatic Glands* (1787).

[75] Buchan (1729-1805), who gave up divinity for medicine, studied at Edinburgh and later wrote the very popular *Domestic Medicine, or Family Physician*, and also works on diet, motherhood, and syphilis.

[76] Kentish, physician at Huntingdon, member of the Royal Medical Society at Edinburgh.

follow a sensible regimen and have a nourishing diet and moderate exercise. Medicine ought to assist, not obstruct nature. Sea air was a good accompaniment of diet and bathing. Exercise, such as riding, walking, and sailing, should be moderate and constant. Dancing, fencing, swimming, and "a variety of the gymnasia" were excellent. After bathing, people might well take a stimulant and a good rub-down with a coarse cloth, for they were warming and invigorating. Naked bathing was preferable, and "a contrivance called the shower bath" was extremely useful in applying cold water and was good for skin eruptions. Sea water was especially helpful in promoting digestion and encouraging urine.

The following year A[ndrew] W[ilson], an Edinburgh physician, communicated his opinions of Bath waters to the public but at the same time expressly disclaimed any great knowledge of the subject (121).[77] He stressed among other things the variety among individual baths as to their volume, temperature, and chemical constituents. Contrary to some writers he saw no virtue in fixed air. He denied that the waters alone could cure, and he was altogether convinced that they aggravated rather than alleviated some diseases.

The nineties saw no falling off in balneal literature. Thomas Garnett discussed the waters of Yorkshire in a work that was to be frequently reprinted, and more generally the principal mineral waters of England (122). John Latham was primarily concerned with a seaside infirmary (123). Simpson (124), Reid (126), Squirrell (127), and Currie (128) considered the relation of bathing, hot or cold, to health. Nott analyzed certain waters on the continent and in England (125), and Kirwan (129) and Saunders (130) dealt with the general subject of mineral waters. George Gibbes did not hesitate to run counter to William Buchan by composing an acute and learned chemical analysis of Bath waters; perhaps, however, he redressed the balance by another work dealing with the medicinal effects of the same waters (131).[78]

[77] Wilson (1718-92), M. D. Edinburgh, practiced first at Newcastle and later in London; he wrote extensively but had "a peculiar manner of expression and not very intelligible . . . too deep for common readers."

[78] Garnett (1766-1802), M. D. Edinburgh, natural philosopher and very successful physician; Latham (1761-1843), physician extraordinary to the Prince of Wales and a prolific writer; James Currie (1756-1805), a close observer with wide experience, spent some time in Virginia before settling down to practice in Liverpool; John Nott (1751-1825) traveled on the continent and in the East and was a considerable classical scholar; Richard Kirwan (1733-1812), Irish chemist and natural philosopher with an extensive range of interests; William Saunders (1743-1817), M. D. Edinburgh, practiced in London and was an authority on the liver; Gibbes (1771-1851), M. D. Oxford, a thoughtful

Reference has already been made to the guide literature which began to appear shortly before the middle of the eighteenth century (63), and it may be worthwhile here to summarize one of the most complete and popular works of this nature, George Carey's *The Balnea, or history of all the popular watering places in England* (1799).[79] Earlier works of this genre—usually about Bath—had given little medicinal information but they had talked about the waters, described the city, and played up the opportunities for recovery of health and recreation. Carey called his book "little more than a kind of chart, in which the reader, looking over it by his fire-side in the winter, may bethink himself what place would be most convenient for him to visit in the summer." At the same time he warned his readers of the discomforts of traveling and that conditions were never as advertised. In some measure he did for the towns what Elliot did earlier for the waters.

Margate was reasonable, unpretentious, pleasant, and diverse, with libraries, gardens, a good beach, fair accommodations, but rapacious natives. Ramsgate had an excellent pier and a good outlay. Brighton, much visited by the nobility, was a rather ugly town; the Princess Pavillion was a little overwhelming; because of these factors prices were high. There was much, perhaps too much fishing. The theatre was a prominent feature. Weymouth, "the royal watering place," had nothing to recommend it but the convenience of its bathing. Nearby Southampton was a handsome town with a good market and bathing. Bath was an attractive city with wide streets and a good theatre. Harrowgate was dignified and orderly. Cheltenham and Buxton had excellent waters. Of Tunbridge Wells he wrote: "the visitors of this place are for the most part peevish old maids or bloated old dowagers, who now and then bring a frisky young tit or two along with them . . . to keep them out of harm's way, as they call it. Of what quality the mineral springs . . . may be is best known to the diplomatist, who . . . may have analysed them, or the credulous invalid, who may have been complaisant enough to drink them; but, we are told, as every quack says of his nostrum, *they are good for all diseases.*"

With the opening of the new century the interest in baths and health did not diminish or greatly change, and a few works will be referred to in order to reveal the persistent and dominant viewpoints. Arthur Clarke (132) displayed a wide concern with bathing, which was indeed the

writer, was physician to Queen Charlotte. Simpson, Reid, and Squirrell I have not found.

[79] George Carey (1743-1807), son of Henry Carey who wrote "Sally in our Alley," was an actor, playwright, and miscellaneous writer.

major interest of writers in the early 1800's. Alexander Buchan (134) and John Peake (136) offered advice on the matter, and an unknown author (135) seemed more concerned with the moral than with the medical aspects of the situation. John Millar (137) continued the general and controversial discussion on warm and cold bathing. Edward Kentish (138) touched the same problem as well as vapor baths and Bristol waters. Gibney likewise addressed himself to the same questions (139).[80]

On the other hand, Jameson described Cheltenham waters and made some observations on various waters and watering places (133). Sigmond discoursed on mineral waters in general (140), and Scudamore analyzed a number of English wells and even visited a continental spa for scientific purposes (141). John Williams commented both on sea bathing and on mineral waters, natural and artificial. Barlow dealt with the medicinal benefits of Bath (142), and Charles Lyell addressed the British Association on Bath waters (145). At the very middle of the 19th century Lee surveyed the baths of Germany (143), and R. W. Falconer discussed exhaustively those of Bath itself (144).[81] So, in a sense appropriately, this bibliographical sketch may close with this reference to the most significant of English watering places.

Before attempting a recapitulation of what has been related here it may be borne in mind that in addition to the specific treatises, pamphlets, communications to the Royal Society, and magazine notices here cited, casual references of whatsoever variety dotted contemporary literature and private papers. When the time comes to write the full story of balneotherapy such materials should be examined. Travelers recorded their

[80] Alexander Buchan (1764-1824), son of the aforementioned William Buchan, practiced in London; John Millar (1733-1805), M. D. Edinburgh, had an excellent reputation as a physician. Clarke, Peake, Kentish, and Gibney have escaped me. In addition to this group of authors, George Lipscomb (1773-1846), who wrote learnedly on history, public questions, and such medical problems as hydrophobia, produced *A Description of the Matlock Bath; with an attempt to explain the Causes of the Heat and of the Petrifying quality of the springs. To which is added, some account of Chatsworth and Kidleston, and the Mineral Waters of Quarndon and Kidleston* (1802).

[81] Charles Scudamore (1779-1849), M. D. Glasgow, practiced in London and was especially concerned with gout and fevers; Edwin Lee (d. 1870), a very extensive medical writer; R. W. Falconer (1816-81), grandson of the aforementioned William Falconer; Charles Lyell (1797-1875) was of course the great geologist. I have no data on Jameson, Sigmond, Barlow, and Williams. The title of Williams's book is *An Essay on the Utility of Sea Bathing in preserving Health and as a Remedy in Disease. Also Observations on Mineral Waters, Natural and Artificial* (Portsmouth, 1820). Another related work of the early 19th century was M. L. Este, *Remarks on Baths, Water, Swimming, Shampooing, Heat, Hot, Cold, and Vapor Baths* (1812), which is summarized in the *Gent. Mag.*, LXXXII (1812), pt. ii, 458.

impressions; dissertations on health and diseases paid tribute to the curative value of the " waters "; and a legion of diarists, essayists, novelists, and epistolarists reflected the absorbing interest in a " visit to the bath." Although no effort will be made here to refer to more than a fragment of these sources, the citations will perhaps suggest the range of territory that would repay exploration.

Even before Turner and Jones had enumerated the virtues of baths John Leland and probably other travelers were describing their medical assets and social charms, and in the late 16th century Fynes Morison increased this information.[82] A little later, that " fantastic old great man," Robert Burton, praised the curative properties of baths, especially for costiveness and headaches, but warned against immoderate bathing, either as to temperature, length, or frequency, for such putrefied the bodily humors.[83] At the middle of the 17th century John Finch warned Anne Conway that her drinking of Tunbridge waters had laid up store for her distemper; but some years after, the philosopher, Henry More, informed her that his doctor had prescribed Epsom waters for a week or so, these to be followed by Tunbridge water for a fortnight. He himself had resolved to take the Epsom waters boiled but he awaited a report on their mineral content.[84] Towards the end of the same century Narcissus Luttrell referred occasionally to persons taking the waters,[85] and Celia Fiennes related that Astrop had " a Steele water much frequented by ye Gentry "; it had " some mixture of Allum so is not so strong as Tunbridge." [86]

In the 18th century, as the medical literature would surely promise, the " waters " came into their social as well as medicinal apogee.[87] Although

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[82] *An Itinerary* (1617).

[83] *The Anatomy of Melancholy* (New York, 1927), 205, 403, 596.

[84] *Conway Letters* (ed., Marjorie Hope Nicolson, New Haven, 1930), 63-4; 143-44.

[85] *A Brief Historical Relation of State Affairs from September 1678 to April 1714* (Oxford, 1857), 6 vols.

[86] *Through England on a side saddle in the time of William and Mary, being the diary of Celia Fiennes* (ed., E. W. Griffiths, London, 1888), 23.

[87] A. Barbeau, *Life and Letters at Bath in the xviiith Century* (London, 1904); Sir Charles Petrie, *The Four Georges* (Boston, 1936), 97-102. G. O. Trevelyan, *The Early History of Charles James Fox* (London, 1923), 83 n., remarks that Bath was the headquarters of gambling throughout the reign of George II. The rush to the sea was bewailed by William Cowper in his poem, " Retirement ":

> Your prudent grandmammas, ye modern belles,
> Content with Bristol, Bath, and Tunbridge Wells,
> When health required it, would consent to roam,
> Else more attached to pleasures found at home;
> But now alike, gay widow, virgin, wife,

all resorts had their clientele Bath, as might be expected, held the center of the stage, owing some measure of its fame and favor to visits by royalty and much more to Beau Nash and the "wits." Steele has given a quotable description of the place.[88]

> The physicians here are very numerous, but very goodnatured. To these charitable gentlemen I owe, that I was cured, in a week's time, of more distempers than I ever had in my life. They had almost killed me with their humanity. A learned fellow-lodger prescribed me a little something, at my first coming, to keep up my spirits; and the next morning I was so much enlivened by another, as to have an order to bleed for my fever. I was profered a cure for the scurvy by a third, and had a recipe for the dropsy gratis before night. In vain did I modestly decline these favours; for I was awakened early in the morning by an apothecary, who brought me a dose from one of my well-wishers. I paid him, but withal told him severely, that I never took physic. My landlord hereupon took me for an Italian merchant that suspected poison; but the apothecary, with more sagacity, guessed that I was certainly a physician myself.

No source of information about the various wells in the early 18th century can equal Defoe. The trip to Tunbridge, "where the ladies are all undress'd," he said, was "a meer matter of custom; some drink, more do not." The place abounded with gaming, sharping, and intriguing; as for "fops, fools, beaus, and the like, Tunbridge is as full of these, as can be desired . . . Without money a man is nobody" there. On the other hand, at Dulwich great crowds of people thronged every summer from London

> to drink the waters, as at Epsome and Tunbridge; only with this difference, that as at Epsome and Tunbridge, they go more for the diversion of the season, for the mirth and the company; for gaming, or intriguing, and the like, here they go for meer physick, and this causes another difference; Namely, that as the nobility and gentry go to Tunbridge, the merchants and rich citizens go to Epsome; so the common people go chiefly to Dullwich and Stretham; and the rather also, because it lyes so near London, that they can walk to it in the morning and return at night.[89]

Hempstead was a scene of "more gallantry than modesty."[90] Bath

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> Ingenious to diversify dull life,
> In coaches, chaises, caravans, and hoys,
> Fly to the coast for daily, nightly joys,
> And all, impatient of dry land, agree
> With one consent to rush into the sea.

See also William C. Sydney, *England and the English in the Eighteenth Century* (2 vols., 2 ed., Edinburgh, 1891), II, 44-85, for a good survey of watering places. *The Early Diary of Frances Burney, 1768-1778* reflects very well the attitudes of the times.

[88] *The Guardian*, no. 174, dated September 30, 1713.

[89] *A Tour through England and Wales* (Everyman ed.), I, 126-27, 157.

[90] *Ibid.*, II, 5.

would have been a small place except for the hot baths. Once the resort of the sick, it had become " the resort of the sound . . . the bathing is made more a sport and diversion, than a physical prescription for health; and the town is taken up in raffling, gameing, visiting, and in a word, all sorts of gallantry and levity." Many came to drink as well as to bathe, and the waters were especially useful in colic and scorbutic distempers. Nearby Bristol well was good for diabetes.[91] Matlock waters, though excellent, suffered from inaccessibility and poor accommodations. Buxton waters cured scorbutic, scrofulous, and rheumatic ailments.[92] The water of Knaresborough was excellent both for drinking and bathing.[93]

The letters of Elizabeth and Henry Purefoy of somewhat later date also contained interesting clues.[94] In July, 1736, Elizabeth asked her agent in London to " buy mee the last book that came out about the Scarborough Spaw Waters, I think it was wrote by one Dr. Shaw." [95] Her son, Henry, in September of the same year praised the " excellent medicinal spring at a place called St. Landulphs " in Cornwall, a good chalybeate water, " partly of the same nature with Scarborough Spaw waters." Elizabeth, a few years later, spoke good words for the chalybeate waters of Astrop, but she also recommended consulting a physician; Henry spent the season there on one occasion. In April, 1742, in anticipation of drinking the Cheltenham waters he inquired of the postmaster whether the smallpox existed there; learning that it was at towns along the way he went to Bath. A year later he informed a correspondent that Cheltenham waters were procurable at ninepence a bottle; he also supplied directions for drinking them and remarked that there was " Cheltenham on the seall round the cork." His mother related how she had purchased seven bottles of the same and hoped to get more soon. During the summer of 1743 Elizabeth apparently was hesitating between Holt in Wiltshire and Cheltenham, but she and Henry finally decided to spend two weeks at Bath.

Twenty years after, the Duchess of Beaufort admitted that the Bath waters would do her good but she would not rashly venture on a course " without l'Avis des Docteurs." [96] Samuel Johnson found Brighthelmston

[91] *Ibid.*, II, 33-38.
[92] *Ibid.*, II, 160, 166-67.
[93] *Ibid.*, II, 212-13.
[94] *Purefoy Letters* (ed., G. Eland, London, 1931), II, 215, 264, 306, 315, 331-34, 352-56, 371, 374, 388.
[95] Smollett in *Humphry Clinker* remarked that there were " fifty spas in England as efficacious and salutary as that of Scarborough."
[96] Reginald Blunt, *Mrs. Montagu " Queen of the Blues "* (2 vols., London, n. d.), I, 116.

a real benefit to his health in 1782;[97] and the following year Richard Oswald, British Commissioner at Paris, praised the Bath waters to John Jay. Cheltenham appeared very magnificent to Thomas Coutts, the banker, in 1788, and he had high regard for its waters as well as those of Bath, Weymouth, and Tunbridge. Four years later, at Christmas he planned "in spite of the winter and rough weather to go to be boil'd for the Rheumatism at Buxton." In succeeding years he visited Cheltenham, Tunbridge, and Bath which place Lord Guilford thought "as favorable to Matrimony as any other place." Occasionally he complained about the bad weather or the crowds, but on the whole nothing seemed to deter Coutts and thousands like him from putting in a season at a watering place, especially when there was always the opportunity to run into such great men as Warren Hastings or William Pitt.[98]

The indefatigable traveler and diarist of the 80's and 90's, John Byng, also related features concerning the waters.[99] He recorded that Cheltenham waters had been discovered by a grandmother of the present owner, who observing pigeons frequenting the spring in great numbers, proceeded to taste the waters and found them mineral. The good to herself and some friends was so clear that the merits of the waters were soon noised abroad. Byng himself found Cheltenham a dull place. The Malvern waters he thought had no particular taste, but they were "reckon'd a restorative, and as a lotion good for weak or sore eyes." He tired of Buxton and believed it would soon become insignificant, for the waters depended upon fashion and the whim of the physician. Yet "since the increase of luxury, and turnpike roads, and that all gentlemen have the gout, and all ladies the bile, it has been found necessary to fly to the bath, and to sea-bathing for relief." How regrettably the old order had changed! With this astringent comment William Windham registered agreement. Although under the inspiration of a book by William Falconer he realized his own symptoms and in consequence undertook a regular course of bathing which both he and his feminine companions found beneficial, he noted that Bath was generally in a state of decline.[100]

[97] *Life*, II, 452.

[98] *The Whitefoord Papers* (ed., W. A. S. Hewins, Oxford, 1898), 187, 204, 208-9, 212, 214, 232, 243-45, 253, 262.

[99] *The Torrington Diaries* (4 vols., ed., C. B. Andrews, New York, 1935-38), I, 11, 38-40, 122, 124; II, 186, 238; IV, 3.

[100] *The Windham Papers* (2 vols., ed., Earl of Rosebery, Boston, 1913), II, 338-39, 341. For other references from aristocratic sources to watering places, both continental and English, consult *The Wynne Diaries* (3 vols., ed., Anne Fremantle, London, 1936-40), *passim.*

In concluding these scattered judgments by lay contemporaries we can do no better than quote *Peter Porcupine*.[101] Cheltenham was "a nasty ill-looking place, half clown and half cockney . . . Indeed this place appears to be the residence of an assembly of tax-eaters. These vermin shift about between London, Cheltenham, Bath, Bognor, Brighton, Tunbridge, Ramsgate, Margate, Worthing and other spots in England." Cheltenham, the "resort of the lame and lazy, the gourmandising and guzzling, the bilious and the nervous," was

> what they call a "watering place"; that is to say, a place to which East India plunderers, West India floggers, English tax-gorgers, together with gluttons, drunkards, and debauchees of all descriptions, female as well as male, resort, at the suggestion of silently laughing quacks, in the hope of getting rid of the bodily consequences of their manifold sins and iniquities . . . gamesters, pick-pockets, and harlots, young wife-hunters in search of rich and ugly and old women, and young husband-hunters in search of rich and wrinkled or half-rotten men . . .

Little need be said in recapitulation. Of the 470 references dealing specifically with "waters," 431 appeared before 1801, and of these, 414 were produced between 1660 and 1800 inclusive. Of the 431 citations 234 were books, most of which went through more than one edition. This testimony adequately reveals the degree to which English wells excited approval on the part of physicians and public alike. The literature here surveyed, as has been seen, varied all the way from the most uncritical eulogies to acute chemical analyses. It touched some major controversies in medicine, notably Galenic versus Paracelsian; and it impinged on a wide variety of health regimens and theories. If, as indeed must be the case, by no means all the literature has received attention, it is unlikely that any significant type, any important or unique work, has been omitted, or that any fundamental aspect has been neglected. Were the remaining evidence, wherever it exists, gathered up, it would no more than substantiate or elaborate what the preceding pages have emphasized.

Interestingly enough, the character of the literature underwent no extraordinary change in the years covered: Turner and Jones compare favorably with Elliot and Buchan. That the viewpoint kept pace with the general scientific knowledge and outlook was to be expected, as were new interests and terminology. For the most part the emphasis was increasingly chemical, but descriptive as opposed to analytical writing continued to flourish. Before 1800, it is true, the Royal Society had largely turned its attention to other matters and the books on the subject had become

[101] William Cobbett, *Rural Rides* (Everyman ed.), I, 30, 33-4; II, 126.

more and more technical, but, on the other hand, the periodicals still fed the popular appetite, and even when they abstracted the works of learned writers they emphasized the more comprehensible and medicinal features. Indeed the magazines tended to give space only to aspects and to writers, notably Oliver (233), Sutherland (234), Linden (235), Thicknesse (236), Buchan (237), and Denman (238), primarily descriptive in character. The opening up of new spas and the development of seaside resorts, with the consequent enthusiasm attendant upon such novelties, likewise favored this tendency.

If, however, the comments were at times during this more than 200 year period marked by uncritical enthusiasm, the most comprehensive claims, disregard for scientific experiment, and an acceptance of fads and fancies, it can scarcely be maintained that they surpass or even equal the assertions concerning various pills and powders, vitamins and regimens, in our own day. Several writers on baths, it should also be remembered, devoted though they might be to the curative virtues of waters, did not hesitate to issue diverse warnings. For instance, Linden in his account of the waters of Llangyba, which he believed especially effective in curing eye disorders, declared that too many mineral waters had been deceptively palmed off on the public.

Laymen were of course less critical than physicians and it would have been remarkable if some of the most eccentric personalities of the 18th century had not found their greatest opportunity for self-expression at the baths. Matthew Robinson, Lord Rokeby, became virtually amphibious in his zest for ablutions, and it required, so said contemporaries, the authority of an archbishop if not that of a prince to get him out of the water. His sister, on tenterhooks over his many eccentricities, hoped he would not visit Bath during her stay there, for she would " never be able to stand the joke of a gentleman's bathing with a roast loin of veal floating at his elbows, all the Belles and Beaux of the Pump Room looking on and admiring." [102]

Amusing though such individualism is at the distance of two centuries, more normal behavior possesses greater historical importance; and a trip to the baths in search of health was certainly normal. Perhaps we shall witness the recrudescense of such a practice in this country. Somewhat less than a century ago resort to the spas was extraordinarily popular; then came a steady decline. The beneficence of a Bernard Baruch, whose father, Dr. Simon Baruch, so fully appreciated the health possibilities of

[102] Edith Sitwell, *The English Eccentrics* (Boston and New York, 1933), 57-61.

spas, and the informed enthusiasm of physicians may not only revive the popularity of earlier American days but, what is of greater scientific, therapeutic, and even social significance, elevate balneology to the dignity of a respected and scientific branch of medicine.[103] The spirit, the understanding, and the positive medical contributions of the writers noticed above can be revived without any necessity to resurrect what time and greater knowledge have proven unsound.

BIBLIOGRAPHY

Although many resources have been utilized in preparing this bibliography, the periodic discovery of titles previously unsuspected and the realization that bibliographers—even as you and I—often err through ignorance, carelessness, or sheer lack of necessary facilities, have discouraged me from pretending completeness either as to titles or editions. What has been sought is a good working introduction to the subject. I have gathered the information from bibliographies and catalogues, from periodical book lists and my own explorations in the history of medicine.[104]

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[103] Henry E. Sigerist, "American Spas in Historical Perspective," *Bulletin of the History of Medicine*, XI (1942), 133-47.

[104] The chief guides are: Robert Watt, *Bibliotheca Britannica; or general Index to British and Foreign Literature* (4 vols., Edinburgh, 1824);—Frederick Shum, *A Catalogue of Bath Books, being various works on the hot mineral springs of Bath from the sixteenth to the twentieth century, and an alphabetical list of books, pamphlets, and tracts* (Bath, 1913);—*Bibliotheca Osleriana* (Oxford, 1929);—F. W. Bateson, *Cambridge Bibliography of English Literature* (4 vols., New York, 1941), especially vols. I, II;—A. W. Pollard and G. R. Redgrave, *A Short Title Catalogue of Books printed in England, Scotland, & Ireland and of English Books printed abroad, 1475-1640* (London, 1926);—Edward Arber, *The Term Catalogues, 1668-1709* (3 vols., London, 1903);—the British Museum catalogue, and the catalogue of the Surgeon-General's Library. All these are necessarily incomplete or faulty, either because of self-imposed limits of chronology or subject matter or the accidents of their nature. Watt and Shum are confusing by their practice of listing a chapter or section of a book as if it were the whole, and with the other guides suffer through condensation of titles, which is also characteristic of the periodical lists. Shum is also undependable because of his erroneous attributions and alteration of titles. Despite their deficiencies, however, the guides alone have made possible the merits and completeness of the accompanying bibliography. See also Henry W. Freeman, *The Thermal Baths of Bath Their History, Literature, Medical and Surgical Uses and Effects together with the Aix Massage and Natural Vapour Treatment* (London and Bath, 1888) which in addition to a historical and medical survey supplies a few titles, but is no more dependable bibliographically than others. Freeman cites Kinnear, *A New Essay on the Nerves, and the doctrines of the Animal Spirits, rationally considered; showing the great benefit and true use of Bathing and drinking the Waters of Bath, in all Nerve Diseases and Obstructions* (London, 1733) and David Bayne, *A New Essay . . . showing the great benefit, and true use of . . . the Bath Waters . . .* (London, 1738) as two different books; actually they are the same. He dates Wilson's (121) at 1738. He cites Lodowick Bowyer, *A Treatise of warm Bath Water in which is more than*

Various editions have been indicated as they have come to my attention, less from the standpoint of supplying a definitive bibliography than for the purpose of testifying to the extensive importance of balneology during the period here surveyed.

The general scheme is chronological but for convenience I have divided the list into 1) books and pamphlets, and 2) periodical contributions of whatever sort. (This latter section is much less complete—as indeed it is less important—for many periodicals are not available; it will nonetheless serve to indicate the widespread interest.) I have also lumped all the pertinent works of a given author and the related works of a subordinate topic under one number. Where place of publication is omitted, it is presumably London. Complete titles are given whereever possible since they often furnish a comprehensive clue to the contents and viewpoint. In extenuation of the errors that have crept in, let it be said that if I have sinned through oversight my appreciation of the correct information shall make amends for it. Moreover, I cannot refrain from pointing out that many of the works listed are not available and that the earlier authors often had no compunction about issuing the same book under two or more titles. In a few instances I have included titles based on an oblique reference in some early author or similarly obscure source; these are in square brackets since I personally cannot vouch for them.

In this connection I must apologize for using "may have been" altogether too frequently in referring to titles, but it is often impossible to say precisely whether a work—especially if anonymous—was a re-issue of an already identified tract or a completely new edition with new material. Authors and booksellers alike sometimes deceived the public by binding up sheets under a new title, perhaps omitting some sheets, adding a new foreword, grouping the books of two authors or two works of the same author together, or even mingling various works together higgledy-piggledy. A sale was the thing! More information about such practices would be valuable, for after all a new edition of an old book—whatever the character—is scarcely less significant than the publication of an entirely new work in exhibiting interest in the subject. Specific testimony on the size of editions would also be welcome. Whereas in the 16th century printings were normally in the hundreds, by the mid-18th century they were in the equivalent thousands. In any case, however, several thousand copies of various books listed below were circulating about England for many decades.

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200 cures made at Bath in Somerset, by Bathing, Pumping, and Drinking the Water; with a Philosophical Account of the Elements, Subterranean Fires, and Fermentation of Metals, Minerals, &c. Taken from Boyle, Sir I. Newton, Johnus Baccius, Guidott, Boerhaave, Miller, Lister, Chancey (Cheyne?), Oliver, Wynter, Willis, Floyer, Baynard, Quincey, Sydenham, Lodowick Bowyer, and many others. By same (1734) which looks like a work by John Quinton (48); *The Pleasures of the Bath, with the First and Second Part of the Tippling Philosophers* (Bristol, 1721); *Account for Establishing Bath Hospital* (1739); *Chit-Chat; or the Pump Room at Bath in 1813.* Two other works of unmistakable pertinence and verifiability are Dr. John Armstrong (1784-1829), *Practical Illustrations of the Scarlet Fever, . . . and the like; with observations on the Efficacy of Sulphureous Waters in various Complaints* (1818) and Dr. A. Carrick, *Dissertation on the Chemical and Medicinal Properties of the Bristol Hot Well Water. To which is added, Practical Observations on . . . Pulmonary Consumption* (1797).

1. William Turner, *Booke of the Natures and Properties as well as of the Bathes in England as of the Bathes in Germany and Italy* (1562, 1568). This was also included in some editions of Turner's *Herbal*, and in several editions of Thomas Vicary, *The English Mans Treasure. With the true Anatomie of Mans Bodie . . . Also the rare Treasure of the English Bathes written by William Turner. Gathered and set foorth for the benefite and cure of the poorer sort of people . . . by William Bremer. And now sixtly augmented . . . with almost a thousand approved waters and medicines . . . by G. E.* (This is the title of the 1613 edition; other editions of Vicary appeared in 1548, 1577, 1580, 1585, 1587, 1596, 1626, 1633, *et al.* Turner's *Bathes* was included at least as early as 1586, and perhaps in 1580.)
2. John Jones, *The Bathes of Bathes Ayde: Wonderfull and most excellent, agaynst very many Sicknesses, approved by authoritie, confirmed by reason, and dayly tried by experience; with the antiquitie, commoditie, propertie, knowledge, use, aphorisms, diet, medicine, and other thinges therto be considered and observed. Compendiously compiled by John Jones, Physician* (1572).

   ———, *The Benefit of the ancient Bathes of Buckstones, which cureth most greevous Sicknesses, never before published* (1572).
3. Walter Bailey, *A Briefe Discours of certain Bathes or medicinall waters in the Countie of Warwicke neere unto a village called Newnam Regis* (1587).
4. Christopher Middleton, *A Short Introduction for to learne to Swimme gathered out of Master Digbies Booke of the Art of Swimming and translated into English for the better instruction of those who understand not the Latine tongue* (1595).

   William Percey, *The Compleat Swimmer; or, the Art of Swimming . . .* (1658).

   Melchisedech Thevenot, *The Art of Swimming . . . Done out of French* (1699).

   The Art of Swimming, made safe, easy, pleasant, and healthful . . . To which are added, cautions to learners, and advice to bathers, by the late celebrated Dr. Benj. Franklin (ca. 1820).
5. G. W. (?), *Newes out of Cheshire of the new found well* (1600). *A True Report of certain Wonderful Overflowings of Water in Somerset* (1607).
6. Tobias Venner, *Via Recta ad Vitam Longam . . . Also the true use of our famous bathes at Bathe* (1620, 1622, 1628, 1637, 1638, 1650, 1660). The Bath tract was also published separately in 1628: *The Bathe of Bath: or, a necessary compendious treatise concerning the nature, use, and efficacy of those famous hot waters; published for the benefit of all such as yearly, for their health, resort to those baths. With an advertisement of the great utility that cometh to man's body, by the taking of physick in the spring, inferred upon a question moved, concerning the frequency of sickness, and death of people more in that season than in any other. Whereunto is also annexed a censure, concerning the water of St. Vincent's rocks, near Bristol, which begins to grow in great request and use against the stone* (rep., *Harleian Miscellany*, II [1744], 295-306).
7. Edmond Deane, *Spadacrene Anglica, or the English Spaw Fountain in the*

Forest of Knaresborough, in Yorkshire (1626). Probably *Spadacrene Anglica, the English Spaw, or the Glory of Knaresborough, springing from severall famous fountains there adjacent* (York, 1649) was no more than a second edition of the earlier work. *Spadacrene Anglica* was reissued at Leeds in 1736 and with it "also the observations of . . . Dr. Stanhope wherein it is proved . . . that the vitrioline Fountain is equal to the German Spaw."

8. Michael Stanhope, *Newes out of Yorkshire: or, an account of a journey, in the true discovery of a soveraigne Minerall Medicinal Water . . . neere . . . Knaresborough, not inferior to the Spa in Germany* (1626, 1627).

———, *Cures without Care. Or a Summons to all such who finde little or no helpe by the use of ordinary physick to repaire to the Northerne Spaw. Wherein by many presidents of a few late yeares, it is evidenced to the world, that infirmities in their owne nature desperate and of long continuance have received perfect recovery. By vertue of Minerall waters neare Knaresborow in the West-Riding of Yorkshire. Also a description of the said water, and of other rare and usefull springs adjoyning, the nature and efficacie of the Minerals contained in them, with other not impertinent notes. Faithfully collected for the publique good* (1632). This was reissued as *A Relation of certain particular Cures, done by vertue of Minerall Waters neare Knaresborow in the West-Riding of the County of Yorkshire* (1649, 1654).

9. Edward Jorden, *A Discourse of Naturall Bathes and Minerall Waters. Wherein first the originall of fountains in generall is declared. Then the nature and differences of minerals, with examples of particular baths from most of them. Next the generation of minerals in the earth, from whence both the actuall heate of bathes, and their vertues are proved to proceede. Also by what meanes minerall waters are to be examined and discovered. And lastly, of the nature and uses of the bathes, but especially of our bathes at Bathe in Somersetshire* (1631[2], 1632, 1633, 1669, 1673).

10. Lodowick Rowzee, *The Queen's Wells; that is, a treatise of the nature and vertues of Tunbridge water. Together with an enumeration of the chiefest diseases, which it is good for, and against which, it may be used, and the manner and order of taking it* (1630?, 1632, 1670, 1671; rep. *Harleian Miscellany*, VIII [1746], 316-32).

11. Tobias Whitaker, *A Discourse of Waters, their Qualities and Effects, Diaeteticall, Pathologicall, and Pharmacaiticall* (1634; the only reference I have seen to this is in Shum.).

12. Thomas Johnson, *Mercurius Botanicus; huic accessit de Thermis Bathonicis* (1634); the pertinent section was reprinted as *Thermae Bathonicae, sive earum descriptio, vires, utendi tempus, modus* (1674, 1849).

13. John French, *The Yorkshire Spaw, or a Treatise of four famous Medicinall Wells, viz. the Spaw, or Vitrioline-Well; the Stinking, or Sulphur-Well; the Dropping, or Petrifying-Well; and St. Mugnus-Well, near Knaresborow in Yorkshire. Together with the causes, vertues, and use thereof* (1652, 1654). This seems to have appeared a century later as *A Pocket Companion for Harrogate Spaw . . . revised by J. Wood* (Halifax, 1760).

14. [*On Harrowgate Water* (York, 1654).] This may be a convenient title for

the 1654 edition of French or of Stanhope's *Particular Relation*; I have seen only one citation of it.

15. Robert Wittie, *Scarborough Spaw; or, a description of the nature and vertues of the Spaw at Scarborough in Yorkshire. Also a treatise of the nature and use of water in general, and the several sorts thereof* (1660, 1661; York, 1667).

———, *Pyrologia Mimica, or An Answer to Hydrologia Chymica of William Simpson, in Defense of Scarborough Spaw: wherein the five Minerall Principles of the said Spaw are defended against all his Objections, by plain Reason and Experiments. Also a Vindication of the rational Method and Practice of Physick called Galenical, and a reconciliation between that and the Chymical: likewise a further Discourse about the Original of Springs* 1669).

———, *Scarborough's Spagyrical Anatomiser dissected, or an answer to all that Dr. Tonstal hath objected in his book against Scarborough Spaw . . . also reflections upon a late piece called a Vindication of Hydrologia Chymica* (1672).

———, *Fons Scarburgensis, sive Tractatus de omnis aquarum generis origine et usu; speciatim vero de fonte minerali apud Scarborough in comitatu Eboracensi Angliae* (1678).

16. William Simpson, *Hydrologia Chymica: or, the Chymical Anatomy of the Scarbrough, and other Spaws in York-Shire. Wherein are interspersed, Some Animadversions upon Dr. Wittie's lately published Treatise of the Scarbrough-Spaw. Also, a short description of the Spaws at Malton and Knarsbrough. And a discourse concerning the original of hot-springs and other fountains: with the causes and cures of most of the stubbornest diseases (either chronical or acute) incident to the body of man. Also, a vindication of Chymical Physick; where a probable way is propounded for the Improvement of experimental philosophy: with a digression concerning an universal character. Likewise a short account of the principles of all concretes, whether vegetable, animal, or mineral. Lastly is subjoyned an Appendix of the Original of Springs; with the author's ternary of medicines: and the epilogue to the whole, of the essence of the Scarbrough-Spaw* (1669).

———, *Hydrological Essays: or, A Vindication of Hydrologia Chymica: Being a farther discovery of the Scarbrough Spaw, and of the right use thereof. And of the Sweet Spaw and Sulphur Well at Knarsbrough. With a brief account of the Allom Works at Whitby. Together with a return to some queries, propounded by the ingenious Dr. Dan Foot, concerning mineral waters. To which is annexed, an answer to Dr. Tunstal's Book, concerning the Scarbrough Spaw. With an appendix of the anatomy of the German Spaw. And, lastly, observations on the dissection of a woman who died of the jaundice. All grounded upon reason and experiment* (1670).

———, *Zymologia Physica, or A Brief Philosophical Discourse of Fermentation, from a New Hypothesus of Acidum and Sulphur, whereby the Phenomena of all natural hot Baths, the generation of Minerals, the production of many Acidule or Spaw-Waters, the grand appearance of heat,*

fire, and light, etc.; whereby also various other Subterraineal Phenomena, as Damps, Earth-quakes, etc.; are from the Doctrine of Fermentation genuinely solved. With, A Discourse of the Sulphur Bath at Knaresborough (1675, 1679). The latter part of this also appeared separately as *A Discourse of the Sulphurbath at Knarsbrough in Yorkshire* (1675).

———, *The History of Scarborough Spaw, or A further discovery of the excellent Virtues thereof in the Cure of the Scurvy, Hypochondraiac Melancholy, Stone, Gonorrhea, Agues, Jaundices, Dropsy, Women's Diseases, etc. by many remarkable instances: being a demonstration from the most convincing arguments, etc., matter of Fact. Also a discourse of an Artificial Sulphur Bath, and Bath of Sea Water; with the uses thereof in the Cure of many Diseases. Together with a short account of other rarities of Nature observable at Scarborough* (1679, 1680?). The *Term Catalogue* lists without author *An Historical Account of the wonderful cures wrought by Scarborough Spaw on several persons afflicted with Scurvey, Stone, Jaundice, Dropsie, etc.; together with an account of many strange rarities found at Scarborough* (1680), which I take to be a section of the *History of Scarborough Spaw.*

17. Thomas Guidott, *A Discourse of Naturall Bathes* . . . by Ed. Jorden. "The third edition, revised and enlarged; with some particulars of the authors life. To which is added, An Appendix concerning Bathe, wherein the Antiquity, both of the Bathes and City, is more fully discours'd; with a brief account of the nature, and the virtues of the hot waters there." (1669). The fourth edition of this appeared in 1673 as Eugenius Philander, *A Query concerning drinking Bath Water, at Bath resolved.*

———, *A Letter concerning some Observations lately made at Bath. Written to his much honoured friend Sir E. G. Knight and Baronet, M. D. in London* (1674; rep. *Harleian Miscellany*, II [1744], 306-11).

———, *A Discourse of Bathe, and the hot waters there. Also, some enquiries into the nature of St. Vincent's Rock, near Bristol; and that of Castle-Cary. To which is added, A Century of Observations, more fully declaring the nature, property, and distinction of the Baths. With an account of the lives, and character, of the Physicians of Bathe* (1676). The latter part of this was reissued in 1686 as *A Century of Observations; containing further discoveries of the nature of the hot waters at Bath.* Still later it was enlarged as *The Register of Bath, or, two hundred observations. Containing an account of cures performed, and benefit received, by the use of the famous hot waters of Bath, in the county of Somerset, as they, for the most part, came under the observation, and knowledge of Thomas Guidott physician there. Being great part of his experience of the effects of the Baths of Bath, for XXVII years last past* (1694).

———, *De Thermis Britannicis Tractatus accesserunt observationes hydrostaticae, chromaticae, & miscellaneae, uniuscujusque Balnei apud Bathoniam naturam, proprietatem, & distinctionem, curatius exhibentes. Experientiae diuturnioris opus, & plurium annorum pensum, cum indicibus necessariis* (1677, 1691).

———, *A True and Exact Account of Sadlers Wells* (1684).

17. (Cont.), *An Apology for the Bath; being an answer to a late Enquiry into the right Use and Abuse of the Baths in England; so far as may concern the hot waters of the Bath at Somersetshire. With some reflections on fresh cold bathing, bathing in sea water and dipping in baptism* (1705, 1708).
———, *A Collection of Treatises relating to the City and Waters of Bath . . . To which is added, Thermae Redivivae, or the City of Bath described . . . by H. Chapman* (1725).
18. Edmund Borlase, *Latham Spaw in Lancashire: With some remarkable cases and cures affected by it* (1670).
———?, *A farther Account of the Latham Spaw, in Lancashire, as it may conduce to the Public Advantage, under the favor of the illustrious persons, the Proprietors of it* (1672).
19. George Tonstall, *Scarborough Spaw Spagirically Anatomized* (1670). This was bound in 1672 with *A New Year's Gift for Dr. Witty: or the dissector anatomized: which is a reply to the Discourse intituled, An Answer to all that Doctor Tonstall has writ . . . against Scarbrough Spaw* (1672).
20. Henry Chapman, *Thermae redivivae: the City of Bath described: with some observations on those sovereign waters, both as to the Bathing in and Drinking of them* (1673, 1725).
21. John Mayow, "Thermis Bathoniensibus," chap. XV of *Tractatus Quinique Medico Physici* (1674).
22. E. W., *Spadacrene Dunelmensus, or A Short Treatise of an antient Medicinal Foundation, or Vitrioline Spaw, near the City of Durham. Together with the constituent Principles, Virtue, and Use, thereof* (1675).
23. R. Pugh, *Bathonensium et Aquisgranensium Thermarum, Comparatio variis adjunctis illustrata* (1676, 1700).
24. Robert Plot, *The Natural History of Oxford-Shire, being an Essay toward the Natural History of England* (1677; Oxford, 1705).
———, *The Natural History of Stafford-Shire* (Oxford, 1686).
Charles Leigh, *The Natural History of Lancashire, Cheshire, and the Peak, in Derbyshire: with an account of the British, Phoenician, Armenian, Gr. and Rom. Antiquities in those parts* (Oxford, 1700).
John Morton, *The Natural History of Northamptonshire; With some account of the Antiquities. To which is annex'd a Transcript of Doomsday-Book, so far as it relates to that country* (1712).
John Aubrey, *The Natural History and Antiquities of the County of Surrey* (5 vols., 1718-19).
25. John Hall, *Select Observations on English Bodies of Eminent Persons in desperate diseases.....In the close is added, Directions for drinking of the Bath-Water, and Ars Cosmetica, or Beautifying Art:* by H. Stubbs (1679, 1683).
26. John Peter, *A Treatise of Lewisham, but vulgarly called Dullwich, Wells, in Kent; shewing the time and manner of their discovery, the minerals with which they are impregnated, the several diseases Experience hath found them good for; with directions for the use of them* (1681).
27. Martin Lister, *De Fontibus Medicatis Angliae* (1682). *De Thermis et Fontibus*

Medicalibus Angliae (1684) is another title for what is probably the same work.

———, *Novae ac curiosae Exercitationes & Descriptiones Thermarum ac Fontium medicatorum Angliae. Eorum originem, salubrem usum & potationis modum tradentes* (1686).

28. Samuel Haworth, *Description of the Duke's Bagnio, and of the Mineral Bath and new Spa thereto belonging* (1683).
29. Anthony Walker, *Fire out of Water; an Endeavour to kindle devotion from the Considerations of the Fountains God hath made. Designed for those who use the Waters of Tunbridge Wells, Bath, etc.* (1684).
30. *An Exclamation from Tunbridge and Epsom* (1684).
31. *Observations on the Mineral Waters of France, made in the Royal Academy of Sciences by the Sieur Du Clos, Physician in Ordinary to his most Christian King* (1684).
32. Timothy Byfield, *The Artificial Spaw, or Mineral-Waters to drink: imitating the German spaw-water in its delightful and medicinal operations on humane bodies* (1684).

———, *A Short and Plain Account of the late-found Balsamick Wells at Hoxdon, and of their excellent Virtues above other Mineral Waters: which make them effectually cure most Diseases, both inward and outward; with directions how to use it* (1687).

33. Robert Boyle, *Short Memoirs for the Natural Experimental History of Mineral Waters. Addressed by way of letter to a friend* (1684/5).
34. Patrick Madan, *A Philosophical and Medicinal Essay of the Waters of Tunbridge. Written to a person of honour* (1687; rep. *Harleian Miscellany*, I [1744], 569-79).
35. Thomas Ken, *Prayers for the Use of all persons who come to the Bath for Cure* (1692).
36. John Maplet, *Epistolae Medicinales, de Thermorum Bathoniensium* (1694, ed. by Thomas Guidott).
37. Nehemiah Grew, *Tractatus de Salis Cathartici amari in Aquis Ebshamensibus et hujusmodi aliis contenti Natura et Usu* (1695). This was translated as *A Treatise of the Nature and Use of the . . . Salt contain'd in Epsom, and other such waters* (1697). See also [Josiah] Peter, *Truth in Opposition to . . . Falsehood: or a discourse written to . . . assert the right of Dr. N. G. . . . with respect to his invention for making the salt of the purging waters* (1701).
38. Robert St. Clair, *The Abyssinian Philosophy Confuted . . . Being for the most part a translation of Petrus Ramazzini of the wonderful springs of Modena. Illustrated with . . . remarks and experiments by the author and translator* (1697).
39. Robert Peirce, *Bath Memoirs: or, Observations in three and forty years practice, at the Bath, what cures have been there wrought, (both by bathing and drinking these waters) by God's blessing, on the directions of Robert Peirce, Dr. in Physick, and Fellow of the College of Physicians in London, a constant inhabitant in Bath, from the year 1653, to this present year 1697*

(Bristol, 1697). The second edition in 1713 had for its title, *The History and Memoirs of the Bath; containing observations on what cures have been there wrought . . . an account of King Bladud . . . with a philosophical preface . . . of baths in general, and of these in particular.*

40. John Floyer, *An Enquiry into the right Use and Abuses of hot, cold, and temperate Baths in England . . . To which is added I. An Extract of Dr. Jones's Treaty on Buxton-Bath . . . II. A Letter from Dr. Clayton of Lancashire concerning the use of St. Mungus-Well. III. An Abstract of some cures perform'd by the Bath at Buxton* (1697, 1702, 1722, 6th ed. 1732). The title, content, and arrangement varied somewhat in the later editions. For example, the 1732 edition (as well as some of its predecessors) appeared as *The History of Cold Bathing, both Ancient and Modern. In two parts. The first written by Sir John Floyer of Lichfield, Kt. The second, treating of the genuine use of hot and cold baths. Together with the wonderful effects of the Bath-water, drank hot from the pump, in decay'd stomachs, and in most diseases of the bowels, liver, and spleen, etc. Also proving that the best cures done by the cold baths, are lately observed to arise from the temperate use of the hot baths first. To which is added, An Appendix. By Edward Baynard, Fellow of the College of Physicians.*
41. Benjamin Allen, *The Natural History of the Chalybeat and Purging Waters of England, with their particular essays and uses. Among which are treated at large the apoplexy & hypochondriacism. To which are added, some observations on the Bath waters in Somersetshire* (1699).

    ———, *The Natural History of the Mineral-Waters of Great Britain. To which are added some observations of the cicindela, or glow-worm* (1711).
42. Edward Ward, *A Step to the Bath with a Character of the Place* (1700).
43. Joseph Browne, *The Modern Practice of Physick vindicated . . . Together with an appendix in a letter to . . . Sir John Floyer about the further use of cold baths* (1703).

    ———, *An Account of the Wonderful Cures performed by the Cold-Baths; with advice to the water-drinkers at Tunbridge, Hempstead, Astrope, Knaresborough, and all the other Chalibeat Spaws: wherein the usefulness of cold bathing is further recommended to lovers of coffee, tea, chocolate, brandy, etc. preferring the use of bathing in these springs before the drinking of their waters; with a table of diseases, in which cold baths are proper, or dangerous. To which is prefixed, a letter from Sir John Floyer; in answer to one of the authors to him, about the further use of cold baths* (1707).
44. *Essays on the Preservation and Recovery of Health. In two Parts. Wherein the late Wines are suspected and censured: Malt drink, Hops, Cider, Artificial Wines, Coffee, Tea, etc. as also drinking of water, and the elaborate compositions in Eating, impartially examined; the Hot and Cold Baths, with their benefits and inconveniences, enquired into . . .* (1704).
45. William Oliver (the first), *Treatise on Fevers and the Bath Waters* (1704).

    ———, *A Practical Dissertation on Bath Waters* (1707, 1716, 1719, 1746, 1764).
46. Andrew Brown, *Motive of Cold Baths; with an advice respecting water drinking* (1707).

47. Jeremiah Wainewright, *A Mechanical Account of the Non-Naturals; being a brief explication of the changes made in human bodies by air, diet, etc.; with an inquiry into the nature and use of baths, and the doctrine of animal secretion* (1707, 1708, 1718, 5th ed. 1737).
48. John Quinton, *Practical Observations in Physick, but especially of the nature of mineral waters and metallick medicines* (1707, 1711).

    ———, *De Thermis; or, of natural and artificial Baths* (1726).

    ———, *A Treatise of Mineral Waters, particularly of Bath in Somersetshire; shewing the excellent qualities of Bath Waters, and many extraordinary cures made there by drinking at the fountain, and bathing seasonably; and an encouragement for frequent bathing; with the observations and opinions of the best physicians that ever wrote on that subject, viz. Baccius, Guidot, Jones, Cheyne, Floyer and Baynard, Winter, Oliver,* etc. (1733; probably *A Treatise of warm Bath water, and of cures made lately at Bath, in Somersetshire* [Oxford, 1733/4] is another issue of the same work.).
49. John Toland, *The Description of Epsom, with the Humors and Politicks of the Place: in a letter to Eudoxa* (1711).
50. M. Nessel, *A Treatise concerning the Medicinal Spaw Waters* (1714).
51. *A Description of Bath: A Poem. In a Letter to a Friend* (1720, and, slightly modified and inscribed to Princess Amelia, 1734).
52. George Cheyne, *Observations concerning the nature and due method of treating the gout, for the use of my worthy friend, Richard Tennison, Esq.: together with an account of the nature and qualities of the Bath Waters* (1720, 3d ed. 1721, 5th ed. 1723, 7th ed. 1725, 8th ed. 1737, 10th ed. 1753).
53. John Hancocke, *Febrifugam Magnum: or Common Water the best cure for fevers, and probably for the plague* (1722, 1723 [3], 1726, *et al.*). This was translated into French.

    James Gardner, *Remarks on the Rev. Dr. Hancocke's Febrifugam Magnum. Wherein are shewn the Absurdity and Inconsistency of the Doctor's reasoning, and the inevitable Danger consequent upon the use of cold water in fevers* (1723).

    A Counterfeit detected, and justly exposed; in answer to the remarks upon Dr. Hancocke's Febrifugam Magnum. Being some Hints for the use of one Mr. . . . Grier, who calls himself James Gardner M. D. (1723).

    Febrifugam magnum, Morbifugam magnum: or the Grand Febrifuge improved; being an essay, to make it probable that Common Water is good for many distempers that are not mentioned in Dr. Hancocke's Febrifugam Magnum (1723).
54. John Smith, *The Curiosities of Common Water: or the Advantages thereof in preventing and curing many Distempers. Gather'd from the writings of several eminent physicians, and also from more than forty years experience* (2d ed. 1723; the S. G.'s catalogue lists 13 eds., including 2 American; there were 4 translations into foreign languages.).
55. Herman van der Heyden, *Arthritifugum Magnum. A Physical Discourse on the wonderful virtues of cold water* (1724, trans. from Latin).
56. John Winter, *Cyclus Metasyncriticus; or an Essay on Chronical Diseases, the*

Methods of Cure; and herein, more fully, of the Medicinal Waters of Bath and Bristol, their several virtues and differences (1725, 1728).

———, *Of Bathing in the hot-baths at Bathe; chiefly with regard to the palsie, and some diseases in women* (London and Bath, 1728).

57. Thomas Short, *A Rational Discourse on the Inward Uses of Water. Shewing its nature, choice, and agreeableness to the blood; . . . in what diseases restorative* (1725).

———, *The Natural Experimental, and Medicinal History of the Mineral Waters of Derbyshire, Lincolnshire, and Yorkshire, particularly those of Scarborough. Wherein they are carefully examined and compared, their contents discovered and divided, their uses shewn and explained, and an account given of their discovery and alterations. Together with the natural history of the earths, minerals and fossils through which the chief of them pass. The groundless theories, and false opinions of former writers are exposed, and their reasonings demonstrated to be injudicious and inconclusive. To which are added, large marginal notes, containing a methodical abstract of all the treatises hitherto published on these waters, with many observations and experiments. As also four copperplates representing the crystals of the salts of thirty-four of those waters* (1734-40, 1743).

———, *The Contents . . . of Nevil-Holt Spaw-Water* (1749).

———, *A General Treatise on the various cold Mineral Waters in England* (1765).

58. [J. Byrom], *Tunbridgiale, a poem* (1726, Works, 1773).

59. [John Medley, *Tentamen Hydrologicum* (1730).] I found this cited in the footnote of a contemporary volume, but have failed to discover any other reference to it.

60. Peter Shaw, *An Enquiry into the Contents, Virtues, and Uses, of the Scarborough Spaw-Waters: with the method of examining any other Mineral-Water* (1734).

61. John Soame, *Hampstead-Wells: or, directions for the drinking those waters. With an appendix relating to the original of springs in general; with some experiments of the Hampstead Waters, and histories of the cures* (1734).

62. Charles Perry, *An Enquiry into the Nature and Principles of the Spaw Waters . . . To which is subjoined a cursory inquiry into the nature and properties of the Hot Fountains at Aix-la-Chapelle* (1734).

———, *An Account of an Analysis made on the Stratford Mineral Water* (1744).

63. *A Journey from London to Scarborough* (1734).

John Wood, *An Essay towards a Description of the City of Bath* (Bath, 1742, *et al.*).

Christopher Anstey, *The New Bath Guide* (1766-1832; 11th ed. 1779; 22d ? ed. 1832).

T. B. Barr, *The History of Tunbridge Wells* (1766).

The New Brighthelmstone Directory, in the Manner of the New Bath Guide (Durham, 1770).

A Description of Brighthelmstone (1780).

J. Spranger, *The Tunbridge Wells Guides* (Tunbridge Wells, 1780).
[S. Moreau], *A Tour to Cheltenham Spa* (Bath, 1783).
The Weymouth Guide (1785).
New Brighton Guide (1796).
A New Scarborough Guide (1797).
T. Hinderwell, *History of Scarborough* (1798).
A Journal of a Tour to Scarborough in 1798 (Wisbech, 1798).
George Carey, *The Balnea, or, history of all the popular watering places in England* (1799).
A Companion to the Watering and Bathing Places of England (1800).
Tour of Health and Pleasure: or a visit to the principal sea bathing places and Mineral Waters in England [Mavor, *British Tourists* VI (1800)].
William Hyatt, *Guide in a Tour to the Watering Places and their Environs, in the South-east of Devon* (1803).
A Guide to all the Watering and Sea-Bathing Places, with a description of the Lakes, a sketch of a tour in Wales, and Itineraries (1803).
W. Hutton, *The Scarborough Tour in 1803* (1804).
The Harrowgate Visitor's Pictorial Pocket-Guide. To which is added a treatise on . . . the Harrogate Mineral Waters. By a Member of the Royal College of Surgeons (Ripon, 1841).
The Illustrated Hand-Book for Harrogate . . . Also . . . observations on the medicinal springs of Harrogate, by G. Hennion (Harrogate, 1858).

64. John Atkins, *A Compendious Treatise of the Contents, Virtues, and Uses of cold and hot mineral springs in general; particularly the celebrated waters of Scarborough; with observations on their quality, and proper directions in drinking them: the whole consisting of what is chiefly useful in the works of the most celebrated authors who have wrote on this subject, with practical observations. To which are annexed, The Opinions of Sir John Floyer and Dr. Baynard, on the great use and effect of bathing in the sea* (1736).
65. J. King, *An Essay on hot and cold bathing; with some observations on the mineral waters at Bungay in Suffolk* (1736, 1737).
66. James Taverner, *An Essay upon the Witham Spa* (1736).
67. P. Keir, *An Enquiry into the Virtues of the Medicinal Waters at Bristol, and their use in the cure of Chronical Distempers* (1739).
68. John Shebbere, *A New Analysis of the Bristol Waters. Together with the Cause of the Diabetes and Hectick, and their Cure, as it results from those Waters, experimentally considered* (1740, 1760).
69. William Hillary, *An Inquiry into the Contents and Medicinal Virtues of Lincomb Spaw Water, near Bath* (1742).
70. Sir Christopher Meighan, *A Treatise of the Nature and Powers of the Bath Waters, and of Bareges, in the cure of gunshot wounds, and all sorts of ulcers. To which is added, An Inquiry into the cause of heat in Bituminous Waters* (1742, 1764).
71. William Baylies, *Remarks on Dr. Perry's Analysis, made on the Stratford mineral water; with a short essay . . . towards a more perfect examination into the same waters* (Stratford upon Avon, 1745).

———, *Practical Reflections on the Uses and Abuses of Bath Waters* (1757).

72. George Randolph, *An Enquiry into the Medicinal Virtues of Bristol Water: and the indications of cure which it answers* (1745, 1750).
———, *An Enquiry into the Medicinal Virtues of Bath-Water, and the indications of cure which it answers* (1752).
73. Mattheus Manning, *Aquae Minerales* (1746).
74. D. W. Linden, *A Treatise of the Origin, Nature, and Virtues of Chalybeat Waters, and natural hot baths* (1748, 1755).
———, *Directions for the Use of that . . . mineral water, commonly called Berry's Shadwell-Spaw, in Sun Tavern Fields, Shadwell* (1749).
———, *An Experimental Dissertation on the Nature, Contents, and Virtues of the Hyde-Spaw-Water, near Cheltenham, in Gloucestershire . . .* (1751).
———, *A Treatise on the Medicinal Mineral Water at Llandrindod, in Radnorshire, South Wales; with some remarks on Mineral and Fossil Mixtures in their native veins and beds, at least as far as respects their Influence on Water* (1755, 1756?).
———, *A Medicinal and Experimental History and Analysis of the Hanlys-Spaw, Saline, Purging, and Chalybeate Waters, near Shrewsbury* (1758).
———, *A Seasonable and Modest Reply to Dr. Lucas' Cursory Remarks on Dr. Sutherland's Treatise on Bath and Bristol Waters; in which the innocency of Brimstone is vindicated, and Dr. Sutherland's Experiments on the Existency of that Mineral in Bath Waters are confirmed* (1765).
———, *An Experimental and Practical Inquiry into the Ophthalmic, Anti-scrophulous, and Nervous Properties of the Mineral Waters of Llangybi, in Carnarvonshire; to which is annexed, An Essay on the Prize Question proposed by the Royal Academy of Bordeaux for the year 1767, on the subject of Analysing Mineral Waters* (1769).
———, *The Theory and Uses of Baths, being an extract from the essay on waters . . . with marginal notes, by Dr. Achmet* (Dublin, 1772). The "essay on waters" is that of Charles Lucas; see below no. 86.
75. *Observations on the Mineral Waters at Islington* (1751).
The Efficacy of the Waters of Glastonbury (1751); I assume this to be the abbreviated title of *Wilt thou be made Whole? Or the Virtues and Efficacy of the Water of Glastonbury, in the County of Somerset* (1751). Perhaps also it is identical with what Shum lists as "Description of the Waters of Glastonbury. By a disinterested clergyman, not at all obliged to the Inhabitants nor in the least concerned in the interest of that town" (1751).
Francis Home, *An Essay on the Virtues of Dunse Spaw in Scotland* (1751).
76. John Summers, *A Short Account of the Successes of warm Bathing in Paralytick Disorders* (1751).
77. William Oliver (the second), *A Practical Essay on the Use and Abuse of warm Bathing in Gouty Cases* (1751; London and Bath, 1753). The two William Olivers were not related.
78. Tobias Smollett, *An Essay on the External Use of Water. In a letter to Dr. * * *. With particular remarks upon the present method of using the mineral waters at Bath in Somersetshire, and a plan for rendering them more safe, agreeable, and efficacious* (1752).
79. T. Glass, *An Account of the Ancient Baths, and their use in physic* (1752).

80. Richard Russel, *A Dissertation on the Use of Sea-Water in the Diseases of the Glands. Particularly the scurvy, jaundice, King's Evil, leprosy, and the glandular consumption . . . To which is added a translation of Dr. Speed's Commentary on Sea Water. As also an account of the nature, properties and uses of all the remarkable mineral waters in Great Britain* (1752, 1753, 1760).

81. Robert Whytt, *An Essay on the Virtues of Lime-Water in the Cure of the Stone* (Edinburgh, 1752, 1754).

———, *Observations of the Dropsy in the Brain. To which are added his other treatises never hitherto published by themselves* (Edinburgh, 1768). This included the "The Carlsbad Waters."

F. Swinhow, *De Thermarum antiquitate, contentis et usu* (Edin., 1752).

William Horsburgh. *Experiments and Observations upon the Hartfell Spaw; and an account of its medicinal virtues* (Edin., 1754).

J. Maddocks, *De lavatione frigida* (Edin. 1762).

S. Martin, *De Balneo* (Edin., 1765).

A. Kuhn, *De lavatione frigida* (Edin., 1767).

B. Parr, *De Balneo* (Edin., 1773).

William Alexander, "A Person seemingly killed by a Blow on the Breast, recovered by Bleeding and the Warm Bath," *Essays, Physical and Literary*, III (1771), 512.

———, *Plain and Easy Directions for the use of Harrowsgate Waters* (Edin., 1773).

82. Rice Charlton, *A Treatise on the Bath Waters: wherein are discover'd, the several principles of which they are compos'd; the cause of their heat; and the manner of their production* (1753; Bath, 1754).

———, *An Enquiry into the Efficacy of Warm Bathing in Palsies* (Oxford, 1770).

———, *Three Tracts on Bath Water. Tract the I. A Chymical Analysis of Bath Water. II. An Inquiry into the Efficacy of Bath Water in Palsies. III. History of Hospital Cases, under the care of the late Dr. Oliver, with Additional Cases and Notes* (1774/5; the first two tracts were published separately in second editions at Bath, 1776).

83. George Macaulay, "Case of a locked Jaw. Cured by Opium and warm Bath," *Medical Observations and Inquiries*, II (1755), 130.

84. T. Reynolds, *Some Experiments on the Chalybeate Water lately discovered . . . at Bromley, in Kent; with Observations on Chalybeate Waters in general, and the most successful method of drinking them* (1756).

85. John Wall, *Experiments and Observations on the Malvern Waters* (1756, 3d ed. 1763; reprinted in *Medical Tracts by the late John Wall M. D. of Worcester*. Collected and republished by Martin Wall, M. D. [Oxford, 1780, 1781], pp. 105-303).

———, *A Treatise on the . . . waters of Pyrmont . . . Also of the Malvern Waters from Dr. Wall's Observations* (1762).

86. Charles Lucas, *An Essay on Waters* (3 vols., 1756).

———, *The City and Thermal Waters of Bath, addressed to the Right Honourable The Earl of Chesterfield* (1756).

86. (Cont.), *An Analysis of Dr. Rutty's Synopsis of Mineral Waters* (1757).
———, *Cursory Remarks on the Method of Investigating the Principles and Properties of the Bath and Bristol Waters; set forth in Attempts to revive ancient Medical Doctrines and in an Attempt to ascertain and extend the virtues of these waters; both by Alexander Sutherland M. D. of Bath and Bristol Hot-Wells* (Bath, 1764).
———, *The Tonnelett [Spa Water] Vindicated* (1766).

87. *Letters of Doctor Lucas and Doctor Oliver. Occasioned by a physical confederacy discovered in Bath* (Bath, 1757); Wm. Baylies, *A Narrative of Facts, demonstrating the actual existence and true cause of that physical confederacy, in Bath, made known to the public in the printed letters of Dr. Lucas and Dr. Oliver* (Bath, 1757).

88. John Rutty, *A Methodical Synopsis of Mineral Waters, comprehending The most celebrated medicinal waters, both cold and hot, of Great-Britain, Ireland, France, Germany, and Italy, and several other parts of the World. Wherein their several impregnating minerals being previously described, and their characteristics investigated, each water is reduced to its proper genus; and besides the particular analysis, the virtues, uses, and abuses of the water are described. In a method entirely new. Interspersed with tables, tending to throw light upon this intricate subject; and abstracts of the principal authors who have treated on mineral waters; and the accounts, dispersed in the acts of most of the learned societies in Europe, are collected and properly digested* (1757).
———, *An Essay towards a natural, experimental and medicinal History of the mineral waters of Ireland . . . The whole illustrated with tables exhibiting a clear view of the experiments in concert, and a comparison of the Irish to the English and other foreign waters* (Dublin, 1757).
———, *The Analyser analysed. To which is added an Appendix, as a specimen of decency, candour and humanity, entitled, An Analysis of Dr. Rutty's Methodical Synopsis of Mineral Waters. By C. Lucas.* This actually may be the same as *A Free and Candid Examination of a pamphlet intituled an Analysis of Dr. Rutty's Methodical Synopsis of Mineral Waetrs* (1758).

89. Alexander Sutherland, *The Nature and Qualities of Bristol Water; illustrated by experiments and observations; with practical reflections on Bath Waters occasionally interspersed* (Bristol, 1758). The second ed. (1764) bore the title, *An Attempt to Ascertain and Extend the Virtues of Bath and Bristol Waters by Experiments.*
———, *Attempts to revive ancient Medical Doctrines 1. Of Waters in General. 2. Of Bath Waters in particular. 3. Of Sea Voyages. 4. Of Local Remedies. 5. Of Non-Naturals. 6. Of Plastering in the Small Pox: The whole confined by Histories or Facts* (1763).

90. J. M. Stevens, *A Treatise on the Medicinal Qualities of the Bath Waters. In three Parts* (1758).

91. Jean P. de Limbourg, *A Dissertation on Baths of Simple Water by Immersion, the Pump and Vapour* (2d ed. 1758).
———, *Amusements of the German Spa* (2 vols., 1764).

92. *Observations on the Use of Bathing, warm and cold, and the Diseases it will*

cure without a doctor; with an account of the Cicer Venereum, the celebrated restorative among the ancient Greeks, used in their baths and at their tables, illustrated with its figure (1759).

93. John Awsiter, *Of true sea Bath, and drinking of Salt Water* (1763).
———, *Thoughts on Brightelmston, concerning sea bathing and drinking sea water; with some directions for their use* (1769).
94. *Treatise on cold mineral Waters* (1765).
95. John Symons, *Observations on Vapour Bathing and its Effects, with some particular Cases in which it was used with success* (Bristol, (1766).
96. T. Denman, *A Letter to Dr. Richard Huck, on the construction and method of using vapour baths* (1768).
97. Donald Monro, *A Treatise on Mineral Waters* (2 vols., 1770).
98. Antonio Mastini, *A Short Account of the Waters of Rocoaro, near Voldagno in the Venetian State, in a letter . . . to Sir C. Bunbury* (1770).
99. William Falconer, *An Essay on the Bath Waters; in four parts . . . With a Prefatory Introduction to the Study of Mineral waters in general* (1770, 1772).
———, *An Essay on the Waters commonly used in diet at Bath* (1776).
———, *A Practical Dissertation on the Medicinal Effects of the Bath Waters* (1790).
———, *An Account of the Efficacy of Aqua Mephitica Alkalina . . . in calculous disorders* (5 eds. by 1798).
———, *An Account of the Use, Application, and Success of the Bath Waters in rheumatic cases* (1795).
———, *A Dissertation on Ischias, or the Disease of the Hip Joint, commonly called a Hip Case; and on the use of Bath Waters as a remedy in this complaint* (1805).
100. J. Rotherham, *A Philosophical Enquiry into the Nature and Properties of Water* (1771).
101. Bartholomew Dominiceti, *A Plan for extending the use of artificial water-baths, pumps, vapourous and dry baths, fumigations and frictions* (1771). This may be the same as *A Dissertation on the Effects of artificial medicated water, vaporous and dry baths* (2d ed. 1782, 3d ed. 1794), sometimes credited to R. Dominiceti, or *Description of the Instrument arbitrarily heated and medicated Water Baths* (1780), attributed to the same.
———, *Medical Anecdotes of the last thirty Years, illustrated with medical truths, and addressed to the Medical Faculty, but in an especial Manner to the People at large* (1781). This is primarily given over to balneology.
———, *Ampthill Medicine Bath: Address to the Afflicted, containing a variety of Cures of the Scurvy, and other impurities of the skin* (1788).
102. John Armstrong, *Medical Essays* (1773). See also his *Art of Preserving Health* (first published, 1744).
103. Thomas Cochrane, "On the use of cold bathing in the cure of Tetanus," *Medical Commentaries* (1775), pt. iii, 183.
104. Sir Edw. Barry, *Observations, Historical, Critical, and Medical, on the Wines of the Ancients, and on the analogy between them and modern wines, with*

observations on the principles and qualities of Water, and particularly those of Bath (1775).

105. Daniel Lysons, *Further Observations on the Effects of Calomel and Camphire; with the effects of Calomel in Dropsy; upon Bath Waters; upon Epilepsy; also on the effects of a Decoction of Elm Bark in Cutaneous Eruptions* (Bath, 1777).

———, *Practical Essays on Fevers, Dropsies, Epilepsy, the Colic; and on the use of the Bath Waters* (1783).

106. James Graham, *The General State of Medical and Chirurgical Practice exhibited. In which particularly the errors and trifling Absurdities of the London and Bath Medical Practice, and of the ridiculous manner of using the celebrated and very salubrious Waters of the City are pointed out* (1778).

———, *A New, Plain, and Rational Treatise on the true Nature and Uses of the Bath Waters: shewing the cases and constitutions in which these waters are really proper to be used . . . To which are added, several very remarkable cures performed by Dr. Graham . . .* (1789).

107. Andrew Duncan (ed.), *Medical Commentaries* (1780), pt. ii, contains an address by Dr. [John] Armstrong respecting the use of Matlock Waters.

108. Hugh Smith, *A Treatise on the Use and Abuse of Mineral Waters: also Rules necessary to be observed by Invalids who visit the Chalybeate Springs of the Old and New Tunbridge Wells. Together with some Remarks on the immoderate Use of Sea Water* (1776, 4th ed. 1780).

109. Philip Thicknesse, *The Valetudinarian's Bath Guide: or, the means of obtaining long life and health* (London and Bath, 1780).

———, *An Epistle to Dr. Wm. Falconer, of Bath* (Bath, 1782).

110. John Elliot, *An Account of the Nature and Medicinal Virtues of the Principal Mineral Waters of Great Britain and Ireland, and those most in repute on the continent. To which are prefixed, Directions for impregnating water with fixed air, in order to communicate to it the peculiar virtues of Pyrmont Water, and other mineral waters of a similar nature. Extracted from Dr. Priestley's Experiments on Air. With an appendix, containing a description of Dr. Nooth's Apparatus, with the improvements made in it by others. And a method of impregnating water with sulphureous air, so as to imitate the Aix-la-Chapelle and sulphureous waters* (1781).

111. Robert Willan the Younger, *Observations on the Sulphur Water at Croft, near Darlington* (1782, 1786, 1815). The second ed. was entitled *Experiments and Observations on the Sulphureous Waters at Croft and Harrowgate.*

112. J. Playfair, *A Method of constructing vapor baths, so as to render them of small expence. With a design and description of a convenient hot water bath* (1783).

113. William Wright, "Cases showing the efficacy of cold-bathing in the locked Jaw, etc.," *Medical Observations and Inquiries* (1784), VI, 143.

114. William Corp, *An Essay on the Jaundice, in which the propriety of using the Bath Waters in that Disease, and in some particular affections of the Liver, is concerned* (Bath, 1785).

115. William Buchan, *Cautions concerning Cold Bathing, and drinking the Mineral Waters* (1786). This is also published as "an additional chapter" to the ninth edition of his *Domestic Medicine* (1786).
116. James M. Adair, *Medical Cautions for the Consideration of Invalids who resort to Bath* (1786).
S. Freeman, *Strictures on Adair's "Bath Medical Cautions"* (1786).
117. *A Treatise on Cheltenham Water, and its great use in the present pestilential Contagion* (Birmingham, 1786).
John Barker, *Observations on a late publication on Cheltenham Water: and on some remarks of the Cr----l R----rs upon a treatise on that subject* (Birmingham, 1787).
118. John Ferrar, *An Essay on Castle Connel Spa, on Water in General, and Cold Bathing* (1787).
119. *Narrative of the Efficacy of Bath Waters in various kinds of paralytic disorders, admitted into the Bath Hospital, from the end of 1775 to the end of 1875; with particular relations of 52 cases, published by order of the committee, at the hospital expense* (London and Bath, 1787).
120. Richard Kentish, *An Essay on Sea-Bathing and the internal use of Sea-Water* (1787).
121. Andrew Wilson, *Bath Waters, a conjectural idea of their nature and qualities, in three letters to ——— ———. To which is added, Putridity and Infection unjustly imputed to fevers, a cruel public grievance, attempted to be redressed; with some account of nature and management of plain fevers* (Bath, 1788). This is presumably what Shum has listed as ——— Andrews, M. D., *Bath Waters: an Idea of their Nature* (1788).
122. Thomas Garnett, *Experiments and Observations on the Horley-Green Spaw, near Halifax. To which are added, a short account of two other mineral waters in Yorkshire* (Bradford, 1790).
———, *Experiments and Observations on the Crescent Water at Harrogate* (Leeds, 1791, 1792, 1794, *et al*). This went through seven editions and is probably the same as *A Treatise on the Mineral Waters of Harrogate. Containing the history of these waters, their chemical analysis, etc.* (5th ed. Knaresborough, 1810; 7th ed. 1822).
———, *Synoptical Tables, showing the component parts of the principal mineral Waters, collected from the works of Doctor Saunders, Doctor G[ibbes]* (1809).
123. John Latham, *A Plan of a Charitable Institution, intended to be established upon the Sea Coast, for the accomodation of Persons afflicted with such diseases as are usually relieved by sea bathing* (1791).
124. William Simpson, *Observation on Cold Bathing* (1792).
125. John Nott, *A Chemical Dissertation on the Thermal Waters of Pisa, and on the neighbouring acidulous spring of Asciano: with an historical sketch of Pisa . . . to which are added, Analytical Papers respecting the Sulphureous Water at Yverdun* (1793).
———, *Of the Hotwell Waters, Near Bristol* (1793).
126. Thomas Reid, *Directions for Warm and Cold Sea-Bathing; with Observations on their Application and Effects in different diseases* (1795).

127. R. Squirrell, *Essay on Indigestion and its Consequences; with remarks on bathing* (1795, 1811).
128. James Currie, *Medical Reports, on the effects of Water, cold and warm, as a remedy in fever and other diseases . . .* (Liverpool, 1798-1805, 2 vols., 2d ed.).
129. Richard Kirwan, *An Essay on the Analysis of Mineral Waters* (1799).
130. William Saunders, *A Treatise on the Chemical History and Medicinal Powers of some of the most celebrated mineral waters; with practical remarks on the Aqueous regimen. To which are added, Observations on the Use of cold and warm Bathing* (1800, 1806).
131. George S. Gibbes, *A Treatise on the Bath Waters* (1800, 1801, 1812). The essence of this also appeared as "A Chemical Examination of the Bath Waters," in *A Journal of Natural Philosophy, Chemistry, and the arts* (ed. by William Nicholson, 5 vols., 1797-1802), III (1800), 359-63, 403-4, 452-54.

———, *A Second Treatise on Bath Waters; comprehending their medicinal powers in general, and particularly as they relate to the cure of Dyspepsia, Gout, Rheumatisms, Jaundice, and Liver Complaints, Chlorosis, Cutaneous Eruptions, Palsy, etc.* (1803).

132. Arthur Clarke, *An Essay on the Chemical Analysis and Medicinal Properties of soda water, and other artificial acidulated mineral waters, with some observations on the native mineral springs of Ireland* (Dublin, 1803).

———, *An Essay on warm, cold, and vapour Bathing, with practical observations on sea bathing, diseases of the skin, bilious, liver complaints and dropsy. With several new cases and observations* (?, 1813, 4th ed. 1819, 1820).

———, *A Treatise on Sea Bathing* (1828).

133. Thomas Jameson, *A Treatise on the Cheltenham Waters, and Bilious Diseases; to which are prefixed, Observations of Fluidity, Mineral Waters, and Watering Places* (1803, 1809).
134. Alexander Buchan, *Practical Observations concerning Sea Bathing, with remarks on the use of the warm bath* (1804).
135. *Observations on indecent Sea bathing, as practised at different watering places on the coasts of this kingdom* (1805).
136. John Peake, *Admonitory Hints on the Use of Sea Bathing* (1806).
137. [John Millar], *A Treatise on the Beneficial Effects of Cold and Warm Bathing; with an Appendix; containing A Description of the Baths erected at Portobello, near Edinburgh* (1807).
138. Edward Kentish, *Essay, on Warm and Vapour Baths; with hints for a new mode of applying heat and cold for the cure of disease, and the preservation of Health. Illustrated by cases* (1808, 1809, 1813).

———, *An Account of Baths, and of a Maderia House at Bristol* (1814).

139. John Gibney, *Practical Observations on the Use and Abuse of Cold and Warm Sea Bathing, in various diseases, particularly in scrofulous and gouty cases* (1813).

———, *A Treatise on the Properties and Medical Application of the Vapour Bath* (1825).

140. George Sigmond, *De Aquis thermalibus apud Bathonias* (Edin., 1814).
141. Sir Charles Scudamore, *An Analysis of the Mineral Waters of Tunbridge Wells, with some account of its medicinal properties. To which are annexed some observations on the water with which Tunbridge Wells is chiefly supplied . . . for domestic purposes. By T. Thomson* (1816).
———, *A Chemical and Medical Report of the Properties of the Mineral Waters of Buxton, Matlock, Tunbridge Wells, Harrogate, Bath, Cheltenham, Leamington, Malvern, and the Isle of Wight* (1820, 1833). I assume *Composition and Medical Properties of mineral springs, with observations on the use of them* (2d ed. 1833) and *A Treatise on the . . . Mineral Waters of Buxton* [*and other English Springs*] (2d ed. 1833) to be different descriptive titles for the *Chemical and Medical Report.*
———, *A Medical Visit to Gräfenberg, in . . . 1843; for the purpose of investigating the merits of the water-cure treatment* (1843).
142. E. Barlow, *An Essay on the Medicinal Efficacy and Employment of the Bath Waters* (Bath, 1822).
143. E. Lee, *The Baths of Germany, with notices of the chief French and Swiss Baths. An appendix on the cold water cure, and table of analysis, to which are prefixed practical observations on mineral waters* (2 vols. in 1, 2d ed. 1851, 3d ed. 1854).
144. R. W. Falconer, *The Baths and mineral Waters of Bath* (2d ed. 1858, 6th ed. 1880).
145. Charles Lyell, *Address* [*to the British Association on the Bath Waters*].

PHILOSOPHICAL TRANSACTIONS

146. Anon., Of a Remarkable Spring about Paderborn, in Germany. I (1666), 133; Abr., I, 46.
———, Of other Uncommon Springs at Basil and in Alsatia. I (1666), 134; Abr., I, 47.
———, Of the richest Salt Springs in Germany. I (1666)), 136; Abr., 1, 48.
147. Robert Boyle, Other Inquiries concerning the Sea. I (1666), 315; Abr., I, 118.
148. J. Beale, Some promiscuous Observations made in Somersetshire. I (1666), 323; Abr., I, 121.
———, An Account of some Sanative-Waters in Herefordshire. I (1666), 358; Abr., I, 131.
———, Of Vitriolate Water, with some particulars touching waters. I (1666), 359; Abr., I, 132.
———, The Causes of Mineral Springs further inquired into and the strange and secret changes of liquors examined. IV (1670), 1131; Abr., I, 420.
———, Reflections relating to Mineral Springs . . . considered. The Indications of some healing Springs remarked; with an account of some such springs in England which confirm the Indications; and of others obiter. V (1670), 1154; Abr., I, 423.
———, Advertisements . . . springs, waters, . . . petrifying and metallizing waters, etc. X (1675), 357; Abr., II, 220.

149. Extract of a Letter (written in Latin) by Mr. Michael Behm, Consul at Dantzick, to Mr. John Hevelius, concerning some Chemical, Medicinal, and Anatomical Subjects. II (1668), 650; Abr., I, 237.

150. An Account of [Simpson's Hydrologia Chymica]. III (1668), 845; Abr., I, 303. See also V (1670), 2032; Abr., I, 490, and X (1675), 401; Abr., II, 232, for accounts respectively of his *Hydrological Essayes* and *Zymologia Physica.*

151. Joseph Glanvill, Observations concerning the Bath Springs. IV (1669), 977; Abr., I, 361.

152. Robert Wittie, An Answer to the Hydrologia Chymica of Mr. W. Simpson. IV (1669), 999; Abr., I, 374.

———, The Answer enlarged. IV (1669), 1038; Abr., I, 389.

Daniel Foot, Some Reflections made on the enlarged account of Dr. Wittie's answer to Hydrologia Chymica, chiefly concerning the sudden loss of the virtues of mineral waters. IV (1669), 1040; Abr., I, 389.

Nathaniel Highmore, Some Considerations relating to Dr. Wittie's defence of Scarborough Spa; concerning a Salt-Spring in Somersetshire; and a medical spring in Dorsetshire, in a Letter to Dr. J. Beale, at Yeovil in Somersetshire. IV (1670), 1128; Abr., I. 419.

Robert Wittie, Discourse relating to the notes of Dr. Foot . . . and to those of Dr. Highmore, concerning mineral waters, and extracts made out of them. V (1670), 1074; Abr., I, 463.

An Account of [Tonstal's *Scarborough Spaw* (1670) and *A New Year's Gift for Dr. Witty* (1672)]. VII (1672), 5019; Abr., I, 743.

153. Edward Brown, An Account concerning the Baths of Austria and Hungary; also some Stone Quarries, Talcum, Rocks, etc. V (1670), 1189; Abr., I, 450.

154. ——— Doddington, An Account of the Aponensian Baths, near Padua. VII (1672), 4067; Abr., I, 720.

155. An Account of [Pugh's *Bathoniensium et Aquisgranensium Thermarum Comparatio* (1676)]. XI (1676), 567; Abr., II, 284. [*Observations sur les Eaux Minérales de plusieurs Provinces de France, faites en l'Académie Royale des Sciences, en l'année 1670, et 1671*, par Sieur du Clos (Paris, 1675)]. XI (1676), 611; Abr., II, 300. [Plot's *Natural History of Oxfordshire* (1677).] XII (1677), 875; Abr., II, 394. [Lister's *De Fontibus Medicatis Angliae* (1682)]. XIII (1682), 59, XIV (1684), 579; Abr., II, 577, III, 32.

156. A Letter from Mr. Charles Leigh . . . to Dr. Robert Plot. XIV (1684), 609; Abr., III, 50.

157. Hugh Todd, An Account of a Salt Spring in the bed of the River Wear, in the County of Durham. XIV (1684), 726; Abr., III, 78.

158. William Petty, Some Queries for examining Mineral Waters. XIV (1684), 802; Abr., III, 99.

159. Tankred Robinson, Observations on boiling fountains and subterraneous steams. XV (1685), 922; Abr., III, 136.

———, On the French Macreuse and the Scotch Bernacle; with a continuation of the Account of Boiling and other Fountains. XV (1685), 1036; Abr., III, 173.

160. Robert Peirce, An abstract of a letter giving an instance of the effects of the bath in curing the palsy and barrenness. XV (1685), 944; Abr., III, 140.
161. An account of Boyle's *Memoirs . . . of Mineral Waters* (1684-5). XV (1685), 1063; Abr., III, 183, and of Plot's *Natural History of Staffordshire* 1686). XVI (1686), 207; Abr., III, 336.
162. William Oliver, On the Pressure of Water at several Depths; and of a Well that ebbs and flows. XVII (1693), 908; Abr., III, 585.
163. An account of Grew's *Tractatus de Salis Cathartici* (1695). XIX (1695), 76; Abr., IV, 31.
164. Sir William Beeston, Observations . . . of a hot-bath in the island of Jamaica. XIX (1696), 225; Abr., IV, 79.
165. John Aubrey, On a medicated spring in Glamorganshire. XIX (1697), 727; Abr., IV, 211.
166. An account of St. Clair's translation of Ramazzini in his *Abyssinian Philosophy Confuted* (1697). XIX (1697), 734; Abr., IV, 213.
167. ——— Cay, On some mineral waters at Eglingham in Northumberland. XX (1698), 365; Abr., IV, 317.
168. M. Geoffry, On the mineral waters of St. Amand near Tournay. XX (1698), 430; Abr., IV, 336.
169. An account of Benj. Allen's *Natural History of Chalybeat and Purging Waters* (1699). XXI (1699), 146; Abr., IV, 375.
170. An Account of Dr. Ehm's Treatise of St. George's Bath near Landeck, in the Lordship of Glats, near Silesia. XXV (1706), 2346; Abr., V, 333.
171. Scipio des Moulins, Concerning a Mineral Water at Canterbury. XXV (1707), 2462; Abr., V, 375.
172. Fred. Slare, An examen of the chalybeate, or Spa waters. XXVIII (1713), 247; Abr., VI, 61.
———, Of the nature and virtues of the pyrmont waters, with some observations on their chalybeate qualities. XXX (1717), 564; Abr., VI, 280.
173. Francis Nevill, Observations on Lough-Neagh in Ireland. XXVIII (1713), 260; Abr., VI, 67.
174. Ab. Vater, An Account of the voiding of a great number of Stones during the use of Pyrmont Waters. XXXII (1723), 322; Abr., VI, 656.
175. John Lewis, Of the several strata of earth and fossils found in sinking the mineral wells at Holt, in Wiltshire. XXXV (1728), 489; Abr., VII, 253.
———, Of the nature and virtues of the Holt waters. XXXVI (1729), 43; Abr., VII, 338.
176. John Martyn, An Account of some Observations relating to Natural History, made in a Journey to the Peak in Derbyshire. XXXVI (1729); Abr., VII, 331.
———, Of a new purging spring discovered at Dulwich in Surrey. XLI (1741), 835; Abr., VIII, 523.
177. Nicholas Cyrillus, On the Use of Cold Water in Fevers. XXXVI (1729), 142; Abr., VII, 353.
178. Moreton Gilkes, Account of the petrefactions near Matlock Baths in Derbyshire, with conjectures concerning petrefactions in general. XLI (1740), 352; Abr., VIII, 406.

179. Ambrose G. Hankewitz, An Examination of Westashton Well-Waters, a Well about 4 miles from that of Holt. XLI (1741), 828; Abr., VIII, 522.
180. C. H. Senckenberg, An Examination of the Cheltenham mineral water. XLI (1741), 830; Abr., VIII, 523.
181. Charles Perry, Experiments by way of analysis on the water of the Dead Sea; also upon the Hot Spring near Tiberiades, and on Hamman Pharoan water. XLII (1742), 48; Abr., VIII, 555.
182. James Mounsey, Part of a Letter . . . concerning . . . the Baths at Carlsbad. XLVI (1749), 217; Abr., IX, 688.
183. Stephen Hales, Of the strength of several of the purging waters, especially of that of Jessop's Well. XLVI (1750), 446; Abr., X, 48.

    Swithin Adee, Letter on the virtues of Jessop's Well. XLVI (1750), 451; Abr., X, 48.
184. John Wall, An essay on the waters of the Holy Well at Malvern, Worcestershire. XLIX (1755), 459; Abr., X, 673.

    ———, On the good effects of Malvern Waters in Worcestershire. L (1757), 23; Abr., XI, 68.
185. Jeremiah Milles, Of the Carlsbad mineral waters in Bohemia. L (1757), 25; Abr., XI, 68.
186. John Walker, Of a New Medicinal Well lately discovered near Moffatt in Annandale, in Dumfrieshire. L (1757), 117; Abr., XI, 87.
187. Robert Whytt, Observations on the lithontriptic virtues of Carlsbad water, Lime Water, and Soap. L (1757), 386; Abr., XI, 161.
188. John Rutty, Thoughts on the different impregnations of mineral waters; more particularly concerning the existence of sulphur in some of them. LI (1759), 275; Abr., XI, 392.

    ———, On the Vitriolic Waters of Almwch, in the Isle of Anglesey; with occasional Remarks on the Hartfell Spa . . . and their comparison with other Waters of the same Class. LI (1760), 470; Agr., XI, 439.
189. Joseph L. Bruni, On the hot-baths of Vinadio, in the Province of Coni, in Piedmont. LI (1760), 839; Abr., XI, 495.
190. William Brownrigg, An Experimental Enquiry into the mineral elastic spirit, or Air, contained in Spaw-Water. LV (1765), 218; Abr., XII, 235.

    ———, Continuation of an experimental inquiry concerning the nature of the mineral elastic spirit or air contained in the Pouhon water, and other acidulae. LXIV (1774), 357; Abr., XIII, 541.

    ———, An extract from an essay intituled, On the Uses of a knowledge of mineral exhalations when applied to discover the principles and properties of mineral waters, the nature of burning fountains, and of those poisonous lakes which the antients called Averni. LV (1765), 236; Abr., XII, 244.
191. Daniel P. Layard, Of the Somersham water, in the county of Huntingdon. LVI (1766), 10; Abr., XII, 275.

    Michael Morris, On the Experiments made on the same Somersham water. LVI (1766), 22; Abr., XII, 275.
192. John Howard, Observations on the heat of the waters at Bath. LVII (1767), 201; Abr., XII, 419.

193. John Canton, Observations on the heat of the Bath and Bristol Water. LVII (1767), 203; Abr., XII, 420.
194. Donald Monro, On the sulphureous mineral waters of Castle Leed and Fairburn in Rosshire, and of the salt purging water of Pitkeathly in Perthshire, Scotland. LXII (1772), 15; Abr., XIII, 271.
195. Thomas Percival, Experiments and observations on the water of Buxton and Matlock in Derbyshire. LXII (1772), 455; Abr., XIII, 355.
196. Matthew Dobson, A Description of a petrified stratum formed from the waters of Matlock in Derbyshire. LXIV (1774), 124; Abr., XIII, 510.
197. Observations on the Sulphur Wells at Harrogate, made in July and August 1785. By the Right Rev. Rich. Lord Bishop of Llandaff. LXXVI (1786), 171; Abr., XVI, 83.
198. John G. Schmeisser, Description of Kilburn Wells, and Analysis of their Water. LXXXII (1792), 115; Abr., XVII, 149.

PERIODICALS

199. *Gentleman's Magazine*, IV (1734), 197-98; *Lady's Magazine*, XVIII (1787), 41-3; *Hibernian Magazine*, XXI (1791), pt. ii, 534-36; *Gent. Mag.*, LXI (1791), 1002.
200. *Gent. Mag.*, V (1735), 336; *London Magazine*, V (1736), 579; VIII (1739), March, n. p.
201. *Lond. Mag.*, XII (1743), 303; *Universal Magazine*, XXXII (1763), 323; *Hib. Mag.*, XIII (1783), 608; *Gent. Mag.*, LXXIV (1804), 952.
202. *Lond. Mag.*, XVI (1747), 503; *Scots Magazine*, XIII (1751), 42-3; *Annual Register* (1766), 111-12; *Hib. Mag.*, XVIII (1788), 513-14.
203. *Lond. Mag.*, XXX (1761), 467-69; *Univ. Mag.*, XXX (1762), 13-15; *Hib. Mag.*, VIII (1778), 591.
204. *Scots Mag.*, XXIV (1762), 631-2; *Univ. Mag.*, LVII (1775), 142; LXI (1777), 73-7; *Lady's Mag.*, VIII (1777), 491-92; *Ann. Reg.*, (1786), 118-21.
205. *Univ. Mag.*, XLII (1768), 225-28; *Hib. Mag.*, (1799), pt. ii, 31-2; *Monthly Magazine* XIV (1802), 444.
206. *Univ. Mag.*, XXXIX (1766), 44-5, 97-8, 151-52; *Oxford Magazine*, X (1773), 356-57; *Lond. Mag.*, XLV (1776), 166-67; *Lady's Mag.*, VIII (1777), 256-57; *Town and Country Magazine* XI (1779), 514; *Monthly Mag.*, VI (1798), 350.
207. *European Magazine*, II (1782), 88.
208. *Univ. Mag.*, I (1747), 201-4, 257-60; XXII (1758), 113-19; *Gent. Mag.*, XXXII (1762), 201-2, 564-65.
209. *Univ. Mag.*, II (1748), 273-75; IX (1751), 81-2; XXXVIII (1766), 297-99.
210. *Univ. Mag.*, III (1748), 199; LXXXV (1789), 180-84; *Oxf. Mag.*, VI (1771), 255-56; *Gent. Mag.*, XLIII (1773), 607; *Monthly Mag.*, III (1797), 203.
211. *Scots Mag.*, XI (1750), 102.
212. *Gent. Mag.*, XXI (1751), 294-95, 414-17; *Univ. Mag.*, VIII (1751), 316-17.

213. *Lond. Mag.*, XX (1751), 510-11; *Scots Mag.*, XIII (1751), 441-42.
214. *Univ. Mag.*, XV (1754), 7-11; *Scots Mag.*, XVI (1754), 477-79.
215. *Scots Mag.*, XVI (1754), 373-75.
216. *Scots Mag.*, XVIII (1756), 203-4; *Gent. Mag.*, XXVI (1756), 196-97.
217. *Gent. Mag.*, XXVI (1756), 572-73; XXVIII (1758), 265; XXX (1760), 163; *Lond. Mag.*, XXVII (1758), 399; *Scots Mag.*, XXII (1760), 197-98.
218. *Scots Mag.*, XIX (1757), 411-15; *Lond. Mag.*, XXVI (1757), 390-93; XXVII (1758), 294-95, 561-63; *Gent. Mag.*, XXVIII (1758), 265, 575.
219. *Gent. Mag.*, XXVIII (1758), 358.
220. *Lond. Mag.*, XXX (1761), 375-76.
221. *Scots Mag.*, XXIV (1762), 235-36.
222. *Scots Mag.*, XXXV (1773), 132-33; *Univ. Mag.*, LXXVIII (1786), 315-18, 353-57; *Eur. Mag.*, X (1786), 21-25, 83-85.
223. *Eur. Mag.*, X (1786), 161-2; *Hib. Mag.*, XXIV (1794), pt. i, 401-5; *Gent. Mag.*, LXXIV (1804), 648.
224. *Lady's Mag.*, XX (1789), 208-9; XXI (1790), 402.
225. *Scots Mag.*, LII (1790), 79-84.
226. *Hib. Mag.*, XXI (1791), pt. i, 540-41.
227. *Univ. Mag.*, XCIV (1794), 440.
228. *Gent. Mag.*, LXXVI (1806), 52.
229. *Lond. Mag.*, XXI (1752), 578-79; XXXI (1762), 93-94; XXXIII (1764), 683-84; *Univ. Mag.*, XVIII (1756), 265-68; XXXIX (1766), 75-6; *Eur. Mag.*, *X* (1786), 72, 75-6; *Gent. Mag.*, LXVII (1797), 841; LXXII (1802), 795-96; LXXVI (1806), 791, 823-24; LXXXVI (1816), pt. i, 17-18; LXXXVII (1817), 300-2; LXXXVIII (1818), 325.
230. *Monthly Mag.*, I (1796), 268-70, 270-71; II (1796), 605-8.
231. *Scots Mag.*, IV (1752), 488, 583-88; *Lond. Mag.*, XXI (1752), 515-19; XXII (1753), 65-6; XXIV (1755), 167-68; *Gent. Mag.*, XXIV (1754), 205-7; *Univ. Mag.*, VIII (1756), 222-24.
232. *Eur. Mag.*, X (1786), 198-200; *Univ. Mag.*, LXXIX (1786), 73-9; LXXXI (1788), 239-43.
233. *Gent. Mag.*, XXII (1752), 18-20; *Scots Mag.*, IV (1752), 41-42.
234. *Gent. Mag.*, XXXIII (1763), 350-52, 388-92; *Lond. Mag.*, XXXIII (1754), 376.
235. *Gent. Mag.*, XXXVI (1766), 328; *Scots Mag.*, XXIV (1762), 235-36, 631-32.
236. *Lond. Mag.*, LI (1782), 245.
237. *Eur. Mag.*, IX (1786), 93-95, 150-53; *Univ. Mag.*, LXXVIII (1786), 11-13, 70-73.
238. *Gent. Mag.*, LXXXV (1815), 566-67.

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